

FURTHER NOTES ON AUSTRALIAN COLEOPTERA, WITH  
DESCRIPTIONS OF NEW GENERA AND SPECIES.

By the Rev. T. BLACKBURN, B.A

[Read October 3, 1905.]

XXXV.

LAMELLICORNES LAPAROSTICTI.

TROGIDES (*continued*).

LIPAROCHRUS.

The species of this genus, as distinguished from *Antiochrus*, are of very uniform facies, and much general resemblance, *inter se*, but differing by very satisfactory structural characters. They are easily divided into well-marked groups, distinguished by the number of striæ on the elytra and the external armature of the front tibiæ. The species of only one group—that with numerous, closely placed elytral striæ—are, so far as I know, much subject to variety, and it is just possible that in that group the forms which I regard as varieties of one species may represent a considerable number of very closely allied species. Several species, which I refer to Dr. Sharp's genus *Antiochrus*, have been attributed to *Liparo-chrus*, and concerning that reference I propose offering some notes below, under the heading "*Antiochrus*." Sixteen names have been proposed as names for species referred to *Liparo-chrus*, and one *Liparo-chrus* has been erroneously named as a member of the genus *Caelodes*. Of the above-mentioned seventeen names, however, all except (at most) eight, I believe to be synonyms, or not to represent true *Liparo-chri*, and of the eight one name is of doubtful validity. It will be well to enumerate this synonymy before I pass on to furnish a tabular statement of the distinctive characters of the named *Liparo-chri* of Australia, and to describe two new species which are before me.

*L. crenatulus*, Fairm., *pimelioides*, Lansb., and *globuliformis*, Macl., I believe to be synonyms of *multistriatus*, Har., for reasons set forth below, under the name *multistriatus*.

*L. (Caelodes) bimaculatus*, Macl., is said by Harold to be *L. fossulatus*, Westw. This is probably correct. I have seen the type specimen, and it is certainly a *Liparo-chrus*. My note, when I examined it, is, "*Liparo-chrus*, probably (from memory) *fossulatus*, but there is not a specimen of the latter at hand for comparison."

*L. raucus*, Fairm., is evidently, I think, judged by the description, a synonym of the earlier name, *silphoides*, Har.

*L. ciliboides*, Har., is described in terms that do not distinguish it from *sculptilis*, Westw., and is probably identical with it.

*L. aberrans*, Fairm., *oblongus*, Har., and *politulus*, MacL., must be referred to *Antiochrus*.

*L. asperulus*, Fairm. The author's description of this species does not indicate characters that would enable me to place it in the following tabulation. I conjecture that it has probably tridentate front tibiæ, and if so it certainly must stand among the four species that I have placed last in the tabulation. Fairemaire himself states that it is near one of them (*L. geminatus*, Westw.). The statement that the interstices of its elytra are rugulose seems to distinguish it from all the four species I have referred to above, and its colour being stated as "black" further indicates its distinctness from all of them except *geminatus*. I have not seen any *Liparochnrus* which fits Fairemaire's description. Nevertheless, it is to be noted that the differences cited between this species and *geminatus* (in which the elytral interstices of the elytra have a decided tendency towards rugulosity) are so much of degree that there is room for doubt whether the description may not have been founded on a small, strongly sculptured example of the older species, a doubt that could be set at rest only by examination of the type or of specimens agreeing with Fairemaire's description, and emanating from Fairemaire's locality (Peak Downs, Qu.). If its front tibiæ have only two external teeth the word "nitidissimus" in its description distinguishes *L. asperulus* from its congeners of the same group.

#### TABULATION OF CHARACTERS.

- |   |                       |
|---|-----------------------|
| A. Elytra with closely packed, non-geminate striæ                       | multistriatus, Har.   |
| AA. Elytra with widely spaced striæ, which run in pairs.                |                       |
| B. Front tibiæ bidentate externally.                                    |                       |
| C. Elytra opaque, with nitid granules on the interstices                | silphoides, Har.      |
| CC. Elytral interstices not bearing nitid granules                      | sculptilis, Westw.    |
| BB. Front tibiæ tridentate externally.                                  |                       |
| C. Elytra blackish, each bearing 2 red spots                            | quadrimaculatus, Har. |
| CC. Elytra not bimaculate.  |                       |
| D. Elytral striæ impressed with comparatively large foveiform punctures | fossulatus, Westw.    |
| DD. Elytral striæ finely (or scarcely) punctulate.                      |                       |
| E. Expanded lateral part of pronotum closely punctulate or strigose.    |                       |

- F. Clypeus not abruptly expanded in front of the eye.  
 G. Colour black, or nearly so: elytral interstices somewhat closely punctulate ... .. *geminatus*, Westw.  
 GG. Colour bright ferruginous: elytral interstices very sparsely punctulate ... .. *rufus*, Blackb.  
 FF. Clypeus strongly and abruptly expanded in front of eye ... .. *dilatatifrons*, Blackb.  
 EE. Expanded lateral part of pronotum punctureless, with a few setiferous granules ... .. *nitidicollis*, Blackb.

*L. multistriatus*, Har. I believe this to be an extremely variable species, widely distributed in Northern Australia, and *L. crenatulus*, Fairm., *pinelioides*, Lansb., and perhaps *globuliformis*, Macl., to be synonyms of Harold's name. I have examined a large number of specimens from numerous localities, having the closely striated elytra which distinguish the above-named forms from the other named Australian *Liparochri*, and find among them a wide range of size and many differences in the sculpture of the pronotum, all these differences being observable, *inter se*, among specimens sent in batches from a common locality (*e.g.*, in a batch of specimens from Port Darwin). According to description *crenatulus* differs from *multistriatus* in its pronotum being "sat dense punctatum," while that of *multistriatus* is "in disco parce punctatum." I have both forms, and also many intermediate, and specimens whose pronotum is devoid of puncturation except close to the lateral margin. *L. pinelioides* should be smaller, with the elytra more dilated behind, and having the front angles of the prothorax less acute. A specimen before me presents these characters except the last, but, on the other hand, I have an example with the last-named character very conspicuous, but otherwise agreeing with typical *multistriatus*. *L. globuliformis*, Macl., should be smaller than *multistriatus*, with the pronotum more sparsely punctulate. I have specimens agreeing with the latter character, but have not seen any quite so small as the size Macleay gives (long.,  $1\frac{3}{4}$  l., my smallest specimen being  $2\frac{1}{4}$  l.), and this extremely small size perhaps suggests specific validity. If the characters named as distinguishing the three forms that have been separated from *multistriatus* are to be regarded as valid, several others of the forms before me must be treated as distinct species.

*L. dilatatifrons*, sp. nov. Nitidus: brunneo-rufus; convexus: latissime ovalis: sat glaber: clypeo antice late leviter

emarginato, rugulose subgrosse punctulato, lateribus ante oculos subito sat fortiter dilatatis: prothorace fortiter transverso, antrorsum fortiter angustato, supra in disco sparsim subtilissime (in lateribus fortiter et strigatim) punctulato, lateribus leviter arcuatis, angulis obtusis, basi marginata: scutello sparsim subfortiter punctulato: elytris sat fortiter geminato-striatis striis vix perspicue punctulatis, interstitiis sat latis leviter subconvexis sparsim sat fortiter (nullo modo rugulose) punctulatis: tibiis anticis extus tridentatis. Long.,  $3\frac{1}{2}$  l.: lat.,  $2\frac{1}{2}$  l.

Among the nitid *Liparoehri* having geminate non-punctulate (or nearly so) elytral striæ, this species stands alone (unless *L. asperulus*, Fairm., agrees with it) in having the part of its clypeus immediately in front of the eyes abruptly and horizontally dilated. This clypeal structure is found in some species of other groups (e.g., *multistriatus*, Har.). Australia. I am not sure of the exact locality, but believe it to be in tropical Queensland.

*L. nitidicollis*, sp. nov. Nitidus: brunneo-rufus; convexus: latissime ovalis; sat glaber: clypeo antice late vix emarginato, rugulose grossissime strigato, lateribus ante oculos haud dilatatis; prothorace fortiter transverso, antrorsum fortiter angustato, supra in disco subtilissime sparsissime punctulato, in lateribus haud punctulato sed granulis setiferis sparsis instructo, lateribus arcuatis, angulis anticis subacutis posticis rotundatis, basi marginata: elytris subtilius geminato-striatis, striis vix perspicue punctulatis, interstitiis planis lævibus sat latis: tibiis anticis extus tridentatis. Long., 3 l. (vix); lat.,  $1\frac{4}{5}$  l.

A very distinct species, differing widely from all its congeners in the sculpture of the lateral portions of its pronotum, which are perfectly smooth and very nitid (*i.e.*, devoid of any punctures or strigosity), but bear a few very conspicuous setiferous granules.

N.W. Australia.

#### ANTIOCHRUS.

I have before me about a dozen specimens which I have no doubt are congeneric with *A. brunneus*, Shp. The only difficulty I feel in thus referring them consists in the absence from Dr. Sharp's diagnosis and description of any mention of the peculiar sculpture of the marginal part of the elytra, which is present in all the specimens before me. They, however, present all the characters attributed by Dr. Sharp to *Antiochrus*, and moreover are evidently very close to *Liparo-*



*chrus oblongus*, Har., with which its author subsequently stated that *A. brunneus*, Shp., is identical. If I am in error in referring these specimens to *Antiochrus* they must be regarded as members of an unnamed genus very near to *Liparo-chrus*. There can, at any rate, be no objection to placing them provisionally in *Antiochrus*. Dr. Sharp says that the only definite character he can assign to *Antiochrus*, as distinguishing it from *Liparo-chrus*, consists in the great dilatation and compression of the posterior tibiæ, which is certainly very conspicuous in all the specimens I am discussing; but it is unquestionably the case that the form of the tibiæ is not constant in typical *Liparo-chri*, some of them (e.g., *L. geminatus*, Har.), having hind tibiæ very much compressed and dilated; in fact, almost as strongly as they well could be. I should, therefore, as far as that particular character is concerned, hesitate to regard it as generally satisfactory if it stood alone. I find, however, that the species I regard as *Antiochri* also differ from *Liparo-chrus* very considerably in facies, being (as Dr. Sharp remarks of the typical *Antio-chrus*, though he does not definitely make it a generic character, probably on account of having seen only one species of the genus), in shape more like *Trox* than *Liparo-chrus*, i.e., more elongate, narrow, and parallel than *Liparo-chrus*. When in addition to this marked difference in facies I observe that all these *Trox*-shaped allies of *Liparo-chrus* with exaggeratedly dilated posterior tibiæ have also a peculiar elytral sculpture, of which there is no trace in any described typical *Liparo-chrus*, I have no hesitation in regarding them as generically distinct from *Liparo-chrus*. The peculiar sculpture I refer to is the presence (on the surface of the elytra close within the hinder part of the lateral margin, and more or less extended forward, according to the species) of several very fine, parallel raised lines placed close to each other, and parallel with the actual margin. In *Liparo-chrus* the character of the elytral sculpture is uniform quite up to the margin.

Although it seems desirable to set forth the foregoing notes on a genus of Australian *Trogides*, which appears to me distinct from *Trox* and *Liparo-chrus*, and which I believe to be identical with *Antiochrus*, I regret to find myself unable to write anything satisfactory about the species. The following species are all, I have little doubt, members of this genus:—*A. brunneus*, Shp., and *Liparo-chrus oblongus*, Har., *aberrans*, Fairm., and *politulus*, Macl. As stated above, Harold has identified the first two of these names as representing a single species. The only one of them named in my collection is *A. politulus*, Macl., my example of which has been compared with the type. It appears to be distinct from

*brunneus* and *oblongus*, *inter alia*, by its head not being granulate. It is also quite distinct from all the other *Antiochri* known to me by the extraordinary thickening of the hinder part of the lateral margin of its elytra. Among the remaining eleven specimens before me there are clearly at least four species, but as I am unable to point out any definite character in them as reliably specific—as one of them is certainly variable in respect of sculpture—and as any one of them might be *A. aberrans*, Fairm., I must leave the determination of the species of this genus for future study and increased material.

#### LAMELLICORNES PLEUROSTICTI.

The *Trogides*, which end, as far as known Australian species are concerned, with *Antiochrus* (*vide supra*), form, in the Lacordairean system of classification, the sixth tribe of the first subfamily, or “legion,” (*Lamellicornes laparosticti*) of the family *Lamellicornes*. The seventh tribe of that subfamily, the *Glaphyrides*, has no known representative in Australia. One Australian genus (*Phænognatha*), through its alliance with a non-Australian genus (*Aelopus*), which Erichson referred to the *Glaphyrides*, has been placed by some authors in the same tribe; but Lacordaire (Gen. Col., iii.; p. 160; note 4) has shown that Erichson was wrong in referring *Aelopus* as he did, and that the proper place for it is in the second subfamily of *Lamellicornes*. That this is the case with *Phænognatha* is obvious to any one who examines a specimen of that genus. These remarks seem desirable because *Phænognatha* stands in Masters’ catalogue as a *Glaphyrid*.

The *Lamellicornes pleurosticti* are distinguished from the first subfamily by the position of their abdominal stigmata, the hinder three of them being placed (not on the connective membrane of the dorsal and ventral surfaces, but) on the ventral surface of its segment, so that the last of them is ordinarily visible when the elytra are closed, as well as when they are set open to expose the abdomen fully.

These two subfamilies (or “legions,” as Lacordaire calls them) comprise on the Lacordairean system of classification the whole of the *Lamellicornes*. The second subfamily, with which I hope to deal, in respect of its Australian species, in this and some following memoirs, is divided into four “tribes,” each of which is extensively subdivided into groups, subgroups, sub-subgroups, and so on. The four main groups or “tribes” are the *Melolonthides*, *Rutelides*, *Dynastides*, and *Cetoniides*. The first of these differs from the others in the hinder three of the abdominal stigmata being only slightly distant from the connective membrane, with the consequence

that all the six stigmata are almost in a continuous line, while in the others all the hinder three stigmata are considerably removed from the connective membrane, and therefore quite out of line with the anterior three. The following table shows the characters by which these "tribes" are differentiated:—

- |   |     |     |     |     |               |
|---|-----|-----|-----|-----|---------------|
| A. The abdominal stigmata (or "spiracles") placed almost in a continuous line | ... | ... | ... | ... | Melolonthides |
| AA. The hinder three abdominal stigmata quite out of line with the others.    |     |     |     |     |               |
| B. The claws of the tarsi unequal   | ... |     |     |     | Rutelides     |
| BB. The claws equal.  |     |     |     |     |               |
| C. The front coxæ transverse, and but little prominent                        | ... | ... | ... |     | Dynastides    |
| CC. The front coxæ evidently less transverse and more prominent               |     |     |     |     | Cetoniides    |

Most of the information contained in the preceding remarks is, of course, familiar to students of the *Lamellicornes*, but before passing on to work in which I hope to diagnose some new genera and describe new species it seems well to furnish such a brief recapitulation as the above contains of preliminary facts, in order to start with a clear understanding of the order and plan I propose to follow.

#### MELOLONTHIDES.

This first tribe of the second subfamily of *Lamellicornes* is of all the tribes of the family by far the most numerous represented in Australia. Lacordaire divides it into nine subtribes, and another has since been added by Dr. Sharp. Of these ten subtribes only four are incontestably represented in Australia, while to a fifth subtribe (*Macrophyllides*) have been referred two Australian species (both very rare in collections), whose position in that subtribe appears to me open to some doubt. The following table shows the distinctive characters of these five subtribes:—

- |  |     |                      |
|--|-----|----------------------|
| A. Labrum fixed to the front of the clypeus, and on the same plane with it |     | Systellopides        |
| AA. Labrum not as in the <i>Systellopides</i> .                            |     |                      |
| B. Front coxæ prominent, and not or but little transverse.                 |     |                      |
| C. Palpi inserted very little below the plane of the clypeus               | ... | Sericides            |
| CC. Palpi inserted considerably below the plane of the clypeus             | ... | Sericoides           |
| BB. Front coxæ but little prominent, and strongly transverse.              |     |                      |
| C. Ventral segments soldered together                                      | ... | Melolonthides (true) |
| CC. Ventral segments free  | ... | Macrophyllides       |

The above brief recapitulation of facts regarding the tribe *Melolonthides* is (excepting the tabulation) a mere sum-

mary of matters that I have already discussed at some length in a former memoir (Tr.R.S.S.A., 1898, p. 18, etc.), to which I would refer the reader. I repeat the outline merely to avoid the need of having another memoir in hand while making use of the present one. Referring to the tabulation (in which I have departed somewhat from the characters relied on by Lacordaire) I may remind those who may use it that in characterising large aggregates of species it is almost invariably impossible to find single sharply defined points of difference (such as are required for a tabular statement) that can be relied upon as strongly developed in every member of the aggregates in question. The truth of this remark is illustrated by the character assigned to the *Systellopides*, inasmuch as there are genera of the *Sericides* in which to a casual glance it certainly seems to be present. I have discussed this point before (*loc. cit.*), and therefore merely mention it now with the added remarks that, apart from this character, I cannot see how the *Systellopides* are to be distinguished from the *Sericides* as at present constituted, and that I am unable to satisfy myself that the apparent labrum is really that organ in the *Systellopides*, and is not in such *Sericides* as *Phyllotocus*.

#### SYSTELLOPIDES (First subtribe of Australian *Melolonthides*).

This subtribe consists of eight species, described by Dr. Sharp, to which it seems probable that the two species of the genus *Prochelyna* ought to be added, and I have two new species now to be described. If *Prochelyna* is distinct from all Dr. Sharp's genera, these twelve species must stand divided into eight genera. They are all extremely rare in collections. Dr. Sharp has conjectured that *Metascelis flexilis*, Westw., the *habitat* of which is not known, may be a *Systellopid*, in which case it might probably be Australian. Dr. Sharp's memoir on the subtribe (Ann. Mus. Gen., ix., pp. 311, etc.), supplies an excellent tabular statement of distinctive characters of those species that can be confidently referred to it. I have no information as to the habits of these insects.

#### SPHYROCALLUS.

*S. bicolor*, sp. nov. Rufo-testaceus, clypeo obscuriori, capite postice elytrisque piceis: pronoto, scutello, sternis et femoribus pilis testaceis elongatis dense vestitis: labro lævi; clypeo creberrime sat fortiter punctulato; fronte antice sparsius (postice sparsissime) punctulata; sutura clypeali impressa; prothorace fortiter transverso, antice minus angustato, supra opaco, vix perspicue punctulato (sculptura sub pilos densos abdita), lateribus sat arcu-



atis, angulis obtusis; elytris subnitidis crebre subtilius minus æqualiter punctulatis, leviter minus æqualiter geminato-striatis: tibiis anticis extus tridentatis. Long., 8 l.; lat., 4 l.

This species certainly ought not to be separated generically from *S. brunneus*, Shp., of which I possess an example agreeing perfectly with Dr. Sharp's description, and taken in N.W. Australia (the original locality). Nevertheless, it differs from *S. brunneus* in respect of a character that Dr. Sharp regards as generic in having its clypeus separated from the frons by an ordinary suture, not a raised line. Also, it departs somewhat in the structure of the labrum, which is intermediate between that of *S. brunneus* and *Chilodiplus* (also in my collection), the front portion of that organ being evidently *thickened* or *tumid*, though the organ is not distinctly bipartite, as in *Chilodiplus*. Apart from these slight structural modifications the present species and *S. brunneus* are extremely close, even specifically, the principal external differences being in the darker head and elytra of the present insect, the shorter joints of its antennal flagellum, the opaque pronotum, the less depth of its elytral striæ, its more nitid and less pilose pygidium, its more densely pilose pronotum, the presence of three external teeth on its front tibiæ (my example of *S. brunneus* has only two, including the apical one), and the greater length of its ventral segments. I have no doubt that my *S. brunneus* and *S. bicolor* are male and female respectively of two allied congeneric species. The joints of the flagellum of the antennæ in *brunneus* are nearly four times as long as the preceding four joints together, in *bicolor* scarcely twice as long. Some of the distinctions between the two that I have mentioned above are probably sexual, but those of the labrum, the opacity of the pronotum, and the striation of the elytra (it is hardly likely that the deeper sculpture would be in the male), together with much colour difference and widely separated locality, point to specific distinctness.

W. Australia; near Eucla.

#### ENAMILLUS.

The following species must be referred to this genus according to the tabular statement of the characters of the *Systellogid* genera furnished by Dr. Sharp (Ann. Mus. Gen., ix., p. 319), though it is not unlikely that had it been before Dr. Sharp he would have found a new generic name for it. It presents all the characters indicated for *Enamillus* in the tabulation, but differs from those set out in the subsequent

detailed diagnosis in respect of the antennæ, the basal joint of the flabellum not enfolding the following joints (although the apical joint enfolds the preceding ones, as in *Enamillus*). It also differs widely as a species from the unique *Enamillus* (*E. striatus*, Shp.), especially in its pronotum not being pilose and its elytra not regularly striate, but it is certainly so close structurally to *Enamillus* that no confusion can result from its being assigned to that genus. Unfortunately, my specimen has lost its legs, though in all other respects it is in excellent condition. The *Systellopides* are so rare in collections that I do not like to omit the opportunity of describing this one, and the species of that subtribe are, so far as known, such isolated forms that it is unlikely any other species exists which would be capable of confusion with the present one for want of a description of the colour, etc., of its legs.

*E. sharpi*, sp. nov. Testaceus, antennarum flabello, palporum maxillarium articulo apicali, capite postice pronoto medio et elytris rufo-piceis (pedibus exempli typici carentibus): supra sat glaber sed prothorace piloso-fimbriato; subtus sat hirsutus; capite (labro sat lævi excepto) crebre sat rugulose punctulato; pronoto subnitido minus crebre minus fortiter punctulato, fortiter transverso, antice valde angustato, lateribus fortiter rotundatis, angulis anticis sat acutis posticis nullis: scutello transverso sparsim punctulato; elytris inæqualiter sat crebre punctulatis, subopacis nec velutinis, striis subsuturali fortiter duabus (geminatim positis) modice quatuor (geminatim positis) vix et tribus sublateralibus fortiter impressis. Long.,  $5\frac{1}{2}$  l.; lat.,  $2\frac{1}{2}$  l.

The elytral striæ are as follows:—A subsutural stria deeply impressed except close to the scutellum; three pairs of striæ (the two of each pair very close to each other) at wide intervals from each other and from the subsutural stria, the first pair obsolete in front, but moderately deep behind, the other two pairs scarcely distinct; three entire, fairly deep striæ close to each other and to the lateral margin. The piceous median portion of the pronotum is narrow in front and much dilated hindward, so as to be of triangular form.

W. Australia.

SERICIDES (Second subtribe of Australian *Melolonthides*).

Regarding this subtribe I have little to add to what I wrote seven years ago in the memoir already referred to, where I discussed at some length the character that Lacordaire relied on as essentially distinguishing the *Sericides* from the *Sericoides*, and, without disputing its validity, proposed a

different way of determining its presence or absence, which would involve some variation from Lacordaire's classification of these *Melolonthides*. I still hold the same opinion on the matter that I did then. In the memoir mentioned, however, I omitted to refer to Lacordaire's subdivision (into smaller aggregates of genera) of this and the following subtribe—a reference which seems to be called for by the fact that my proposed different expression of the distinction between the subtribes involves a certain degree of re-arrangement of their "groups" (or sub-sub-tribes). These I ignored, provisionally, and furnished a tabulation of the genera without any intermediate subdivisions. Lacordaire subdivides the *Sericides* into five groups, two of which being non-Australian need not be discussed here; and a third (*Mæchidiides*) has the insertion of its maxillary palpi much below the plane of the clypeus, which I regard as associating them with the *Sericoides* rather than with the other Australian genera that Lacordaire places among the *Sericides*. The *Sericoides* Lacordaire subdivides into six "groups," two of which are not known to be found in Australia. Of the remaining four groups two (*Pachytrichides* and *Aclopides*—at any rate the Australian member of the latter) have their maxillary palpi inserted close to the under surface of the clypeus (as in *Phyllotocus* etc.), and, therefore, in my judgment, should stand near *Phyllotocus*, etc., rather than among such genera as *Colpochila*, *Heteronyxa*, etc. I, therefore, hold that these "groups," assuming that the non-Australian *Aclopid* genus is rightly associated with *Phænognatha*), should be transferred to the *Sericides*, so that there will be four "groups" of Australian *Sericides* and two of Australian *Sericoides*. And here I may refer to a valuable memoir on *Pachytricha* (Ent. M.M. xi., pp. 2, etc.), in which Dr. Sharp discusses the difficulty of placing that genus in the *Melolonthid* series with all the advantage of his profound learning in anatomy, but does not state his own judgment as to what place it should occupy: although I do not find in his remarks anything inconsistent with the view I have taken of the affinities of the genus. The "groups" of the *Sericides* known as occurring in Australia may, then, in my opinion, be thus stated:—

- |     |   |     |     |     |     |                  |
|-----|---|-----|-----|-----|-----|------------------|
| A   | Claws bidentate beneath (size very large)                 | ... | ... | ... | ... | Pachytrichides   |
| AA. | Claws not bidentate beneath (size moderate or small).     |     |     |     |     |                  |
| B.  | Mandibles surpassing the clypeus and embracing the labrum | ... | ... |     |     | Aclopides        |
| BB. | Mandibles normal.   |     |     |     |     |                  |
| C.  | Hind coxæ very wide                                       | ... | ... |     |     | Phyllotocides    |
| CC. | Hind coxæ narrow  | ... | ... |     |     | Diphucenhalides. |

PACHYTRICHIDES (First group of *Sericides*).

The genus *Pachytricha*, with its six described species, monopolises this group. The species are all, so far as I have observed, rare in collections, nor have any, I believe, been taken except in W. Australia. They are very fine, large insects, and are very closely allied *inter se*. They have been fully dealt with by Dr. Sharp in the memoir already mentioned, and I have nothing further to say about them.

ACLOPIDES (Second group of *Sericides*).

Represented in Australia, so far as known, by the single species, *Phenognatha erichsoni*, Hope, which is fairly common in collections, but seems to be limited, in respect of *habitat*, to the far north of the continent.

PHYLLOTOCIDES (Third group of *Sericides*).

For the present I must pass this group over with the mere remark that I am not yet prepared to deal with it more fully and confidently than I did in my former memoir (already referred to): for, although I have made some progress with a revision of that memoir, it is probable that I may be able at no distant date to examine certain types, the inspection of which will enable me to write more definitely than I could do at this time.

DIPHUCEPHALIDES (Fourth group of *Sericides*).

This last group of Australian *Sericides* contains two genera, *Diphucephala* and *Epholcis*—the former numerous in known species, and widely distributed, many of its species very abundant. The latter, so far as at present known, almost limited to tropical regions, consisting of not more than five described species, and not very frequent in collections. What I have said above concerning the *Phyllotocides* may be repeated, *mutatis mutandis*, concerning this group, and I, therefore, omit further remark on it for the present.

SERICOIDES (Third subtribe of Australian *Melolonthides*).

Having referred the *Pachytrichides* and *Aclopides* to the subtribe *Sericides*, I leave only two of the groups into which Lacordaire divided the *Sericoides*, as representing that subtribe in Australia, viz., the *Heteronycides* and *Stethaspides*. They are distinguished from each other by Lacordaire as follows:—

- |   |               |
|---|---------------|
| A. Species not having a sternal projection ...      | Heteronycides |
| AA. Species furnished with a sternal projection ... | Stethaspides  |

The former of these is by far the most abundant in species of all the "groups" of Australian *Melolonthides*. The



number of species is so overwhelming that until a much larger proportion has been carefully studied and described it would not be wise to venture an opinion as to whether they should all remain included within the limits of the one "group" or ought to be split up into several "groups," and therefore I do not propose to discuss that point at present. I have already published a revision of the enormous genus *Heteronyx*, and have now before me a great number of additional species, which I hope to deal with at no distant date. I have also furnished a revision of the extensive genus *Colpochila* and of that also have now numerous additional species. Of the more extensive genera of the "group" there still remains *Liparetrus* to be revised by me, of which, in the following pages I attempt a revision, adding some notes preparatory for more detailed work on some other genera closely connected with *Liparetrus*. I may here draw attention to my having furnished (in the previous memoir already referred to) a tabulation of the characters, together with some notes on the same, of the Australian genera known to me that can be referred to the *Sericoides*, though it should be noted that in that memoir I omitted the *Stethaspides* (probably by an oversight), and limited my remarks to the *Heteronycid* portion of the sub-tribe. That, however, is a matter of little importance, as the known species of Australian *Stethaspides* are only two in number, nor is it probable that there are many more to be added in the future: and, moreover, I do not think that they will stand permanently in the *Sericoid* series. The *Stethaspides*, however, do not call for remark here.

#### LIPARETRUS.

I have found the study of this very extensive genus one of the most difficult tasks that I have encountered in Australian entomology, not on account of the close alliance of its species (for most of them have exceptionally distinctive structural characters), but on account of the very unsatisfactory nature of the monograph of the genus written by Sir W. Macleay, and published in the Proceedings of the Linnean Society of New South Wales, A.D. 1886, which is rendered practically useless by the fact that no reliance can be placed upon the apportionment of the species between the two principal groups into which it divides the genus founded upon the number of joints in the antennæ. I regret to find that I have to make some corrections in my own work on *Liparetrus*, in describing, many years ago, some species as new which I now find had been previously named by Sir W. Macleay, I not having discovered at that time that Sir W. Macleay's statements of antennal structure were in many in-

stances erroneous, so that I assumed species with eight-jointed antennæ to be distinct from those which Sir William asserted to have nine antennal joints. After many attempts to identify Macleay's species by the study of their author's descriptions I arrived at the conclusion that it was impossible to do so, and that an examination of the types (which are in the Sydney Museums) was essential. Accordingly I have recently visited Sydney for the purpose of making that examination, and am now in a position to deal with the matter authoritatively, and the result of my investigations will be found in the following pages.

The number of names that I can ascertain to have been given to species presumably of *Liparetrus*, is 130, of which 29 may be confidently regarded as synonyms, and 9 are so described that they cannot be identified without the examination of types to which I have no means of access, the number of recognisable species being, therefore, 92. To these I have now to add 20 new species, bringing the total up to 112.

As remarked above, the species of *Liparetrus* are in general distinguished by good structural characters, which on first thoughts would suggest the probability of its being easy to break the genus up into satisfactory subgenera and sections; but a prolonged and careful study has forced me to the conclusion that the structural differences are so curiously intermingled that there is not one of them by means of which anything approaching a natural group can be formed. The most striking of the structural characters that I refer to are—(a) nature of sexual differences: (b) form of clypeus: (c) structure of hind tarsi: (d) vestiture of dorsal surface: (e) structure of front tibiæ: (f) structure of antennæ.

The species, however, which are associated by agreement in any one of these respects differ widely as regards the other respects, and the species which are placed together by reliance upon any of them are not naturally associated, and have their closest allies in other groups. I have, therefore, not thought it well to form any subgenera, but have made the best use I can of the structural characters for grouping, without claiming to have succeeded in accomplishing a breaking up into natural aggregates except in so far as I shall indicate in the course of this paper that one or two of the subordinate aggregates seem to be a natural association of species.

It must be noted here, however, that *Liparetrus*, as treated by Blanchard and Macleay, includes a number of species of a genus separated by Burmeister from *Liparetrus* under the name *Automolus* (which I hope to discuss in a future memoir under the heading of that name), and it is to

*Liparetrus*, as characterised by Burmeister, that the preceding remarks refer.

The previous authors who attempted more or less grouping of the *Liparetri* known to them were Burmeister, Blanchard, and Macleay. Burmeister characterised his main groups according to the relative length of the joints of the hind tarsi—a system fairly easy to apply, but supremely unnatural in result. Blanchard founded his groups on antennal structure alone, and this system also leads to unnatural grouping, and in some cases requires use of a microscope. Macleay took the antennal structure as the basis of his classification, with the nature of the sexual distinctions, as indicating secondary aggregates—a system which is not only open to the same objection as Blanchard's, but also is vitiated by the existence of many species of which only one sex is known. I am unable, however, to find any method of grouping the *Liparetri* which will avoid relying upon the characters that I have referred to as unsatisfactory. I hope, nevertheless, to combine them in such fashion as will furnish a tabulation by which few species will be difficult of identification, although I can make no claim for my aggregates of being more *natural* groups than those of the authors I have referred to above. I divide the genus into 19 groups, on each of which separately I append some remarks, but it seems more convenient to make the *tabulation* of the species a continuous one than to provide 19 separate tabulations.

In stating the number of the external teeth of the front tibiæ I have included the apical projection of the tibiæ as a tooth. These teeth do not, I find, as a rule, vary sexually in any marked degree, though they certainly appear to vary in size somewhat in individuals of the same sex. In some species (*e.g.*, *discipennis*, Guér.), with bidentate front tibiæ, the upper tooth is very feeble in some specimens as compared with others, and it is usually most feeble in the males; but where it is well defined in the female it is always, as far as my observation goes, not actually *wanting* in the males. The species showing the greatest sexual disparity, known to me, in this respect is *L. discipennis*. In the closely allied *L. canescens*, Maccl., I do not find any sexual difference whatever in the armature of the front tibiæ.

Before I pass to the tabulated statement of the characters of the species, a list of the names that have to be sunk as synonyms, and some brief notes on the species that I have had to omit from the tabulation, seem to be required. I place the names that must be sunk as synonyms in alphabetical order, setting against each the name

of which it becomes a synonym. *Basalis*, Macl., and *glaber*, Macl., are *nom. præocc.* *Convexus*, Boisd., and *obscurus*, Homb. & Jacq., I have not been able to identify, and merely place them on the authority of other authors. My reasons for the rest of the synonymy will be found detailed in the following pages. It should be noted that *obscurus*, Macl., sinks as a *nom. præocc.*, as well as for the reason noted under the name *picipennis*, Germ. The three *nom. præocc.* are additional to the 29 original names that are synonyms:—

- \**acutidens*, Macl. = *tridentatus*, Macl.
- \**Adelaidæ*, Blackb. = *comatus*, Macl.
- \**agrestis*, Blackb. = *lævis*, Blanch.
- \**basalis*, Blanch. = *sylvicola*, Burm. (? Fab.).  
*basalis*, Macl. = *albohirtus*, Mast.
- \**brunneipennis*, Blackb. = *ubiquitosus*, Macl.  
*convexus*, Boisd. = *sylvicola*, Burm. (? Fab.).
- \**flavopilosus*, Macl. = *fulrohirtus*, Macl.  
*glaber*, Macl. = *lævatus*, Macl.
- \**hirsutus*, Burm. = *marginipennis*, Blanch.
- \**lanaticollis*, Macl. = *Palmerstoni*, Blackb.
- \**latiusculus*, Macl. = *sericeus*, Macl.
- \**Macleayi*, Blackb. = *sylvicola*, Burm. (? Fab.).
- \**Mastersi*, Macl. = *Germari*, Macl.
- \**maurus*, Blackb. = *collaris*, Macl.
- \**montanus*, Macl. = *auscipennis*, Guér.
- \**nigriceps*, Macl. = *lævis*, Blanch.
- \**nigrohirtus*, Macl. = *marginipennis*, Blanch.
- \**nitidior*, Macl. = *picipennis*, Germ.
- \**nitidipennis*, Macl. = *ater*, Macl.  
*obscurus*, Homb. & Jacq. = *iridipennis*, Germ.
- \**obscurus*, Macl. = *picipennis*, Germ.
- \**parvulus*, Macl. = *lævatus*, Macl.
- \**perplexus*, Blackb. = *criniger*, Macl.
- \**propinquus*, Macl. = *rubicundus*, Macl.
- \**pruinosis*, Burm. = *vestitus*, Blanch.
- \**rugosus*, Macl. = *nigrinus*, Germ.
- \**salebrosus*, Macl. = *sylvicola*, Burm. (? Fab.).
- \**senex*, Blackb. = *iridipennis*, Germ.
- \**simillimus*, Macl. = *abnormalis*, Macl.
- \**simpler*, Blackb. = *rotundipennis*, Macl.
- \**spretus*, Blackb. = *asper*, Macl.

The following are the names of the species that I am unable to place in my tabulation. The type specimens of

\* This synonymy has not, I believe, been previously notified.



those of them whose names are not Macleay's are in Europe, I presume, if still in existence:—

*L. uniformis*, Blanch., from Eastern Australia, seems likely to be a member of my twelfth group. The description implies that its elytra are of testaceous colour, without either pilosity or dark markings. If that be so, it is probably a species that I have not seen. Its author supplies no information about the structure of its hind tarsi. Macleay suggests its possible identity with his *luridipennis*, but that is most improbable. The descriptions do not agree, and the localities are very far apart.

*L. convexiusculus*, Macl. Quite unrecognisable by the description. I could not find the type in either of the Sydney Museums, where it might be expected to be.

*L. curtulus*, Burm. I suspect this species of being identical with *ferrugineus*, Blanch., although there are discrepancies of colour which render the identity doubtful. The description of colour agrees better with *ubiquitosus*, Macl., but the clypeus of the male does not seem to agree with that of the latter species. It may be distinct from both, in which case I have not seen it.

*L. glabratus*, Burm. I cannot identify this species. It is probably a member of my fourth group, and seems to be nearest to *incertus*, Blackb., but, *inter alia multa*, differs extremely in colouring. If the type was a specimen from whose propygidium and pygidium the vestiture had been removed by abrasion it might be *L. oratus*, Macl.

*L. glaber*, Burm. This species is scarcely described. There being no information given by its author with regard to even such important characters as the structure of the antennæ and the front tibiæ, it is useless to hazard a guess as to its proper place in the genus.

*L. Lottini*, Dupont. According to Macleay, this species is identical with *L. humilis*, Blanch., in which case it is an *Automolus*. I cannot see, however, that Macleay can have had any solid ground for identifying it with any insect in particular, as the description is quite worthless.

*L. nigricollis*, Hope. This is a mere name; it is unaccompanied by any information that would associate the species with *Liparetrus*; in fact, the scanty remarks on the elytra seem to be more consistent with a place in some other genus.

*L. gagaticeps*, Macl. The presumable type is in the Macleay Museum. It appertains to a species that I have not seen elsewhere. Unfortunately, the structure of its antennæ cannot be examined without manipulation that could not be

resorted to. Those organs, however, I can say with confidence, have not more than eight joints. If they are eight-jointed, the insect should be placed in my tabulation with *lervatus*, Macl., from which it differs by, *inter alia*, its brightly testaceous prothorax. If the antennæ are seven-jointed the insect should be placed in my tabulation with *opacicollis*, Macl., from which it differs by, *inter alia*, its being less than half the size of that species.

*L. striatus*, Blanch. Without information as to the structure of the hind tarsi it is impossible to place this species in a tabulation. If the basal joint of those tarsi be shorter than the second joint it might probably be identical with *L. glaber*, Burm., and also with *ovatus*, Macl., in which case it would have priority over those two names. If its hind tarsi be not as suggested above it is a species that I have not seen.

A. Antennæ 9-jointed.

B. Front tibiæ 3-dentate externally.

C. Basal joint of hind tarsi evidently shorter than the 2nd joint.

D. Disc of pronotum bearing erect pilosity.

E. Erect pilosity largely extended on the elytra.

F. Pilosity of pronotum entirely of pale colour.

G. Front margin of clypeus very deeply emarginate (as deeply as in *abnormalis*, Macl.)

Kennedyi, Macl.

GG. Front margin of clypeus not (or more feebly) emarginate.

H. Basal joint of front tarsi (male) produced at inner apex.

I. Elytra not closely punctulate: geminate striæ well marked ...

comatus, Macl.

II. Elytra closely punctulate: geminate striæ feebly defined ...

fulvohirtus, Macl.

HH. Basal joint of front tarsi (male), not, or scarcely, produced at inner apex.

I. Pygidium black ...

J. Elytra with geminate striæ not, or scarcely, traceable ...

xanthotrichus, Blanch

- JJ. Elytra with geminate striæ well marked ... *necessarius*, *Blackb.*
- II. Pygidium red ... *rufiventris*, *Macl.*
- FF. Pilosity of pronotum blackish in middle part.
- G. Basal joint of front tarsi (male) keeled on inner edge.
- H. Size very large (about 5 l.); geminate striæ of elytra strong ... *ater*, *Macl.*
- HH. Size moderate (about 4 l.); geminate striæ of elytra feeble ... *phœnicopterus*, *Germ.*
- GG. Basal joint of front tarsi (male) not keeled, but produced at inner apex.
- H. Front of clypeus (male) bisinuate emarginate (as in *xanthotrichus*) ... *Mitchelli*, *Macl.*
- HH. Front of clypeus (male) not bisinuate ... *villosicollis*, *Macl.*
- EE. Elytra glabrous, or nearly so.
- F. Clypeus of male truncate; pilosity of pronotum of pale colour.
- G. Clypeus scarcely narrowed forward. Front tarsi of male much thickened ... *Germari*, *Macl.*
- GG. Clypeus considerably narrowed forward. Front tarsi of male scarcely thickened ... *capillatus*, *Macl.*
- FF. Clypeus of male rounded in front: pilosity of pronotum blackish ... *dispar*, *Blackb.*
- DD. Pronotum glabrous on disc, but frilled with erect hairs all across front.
- E. Front margin of clypeus with a median tooth-like obtuse prominence in both sexes ... *Kreusleræ*, *Macl.*
- EE. Front margin of clypeus not prominent in the middle.
- F. Lateral angles of clypeus acute in the male.
- G. All the joints of front tarsi (male) keeled internally ... *lugens*, *Blackb.*
- GG. Tarsi of male not keeled internally.

- H. Elytra strongly pruinose and iridescent ... angulatus, *Macl.*  
 HH. Elytra not pruinose nor iridescent ... fimbriatus, *Blackb.*  
 FF. Lateral angles of clypeus roundly obtuse ... concolor, *Er.*  
 DDD. Pronotum glabrous on disc, or with only a few hairs on the antero-external parts.  
 E. Clypeus conspicuously tridentate in front ... distans, *Blackb.*  
 EE. Clypeus not dentate (or scarcely so).  
 F. Entirely testaceous (including the head) ... aridus, *Blackb.*  
 FF. Some part (at least the head) dark.  
 G. Sides (but not middle part) of front margin of pronotum pilose ... picipennis, *Germ.*  
 GG. Front margin of pronotum glabrous.  
 H. Propygidium and pygidium clothed with coarse squamiform setæ.  
 I. Clypeus (at least of male) sharply truncate, with well defined angles ... lividipennis, *Blackb.*  
 II. Clypeus rounded off at the angles in both sexes.  
 J. Size fairly large (3 l. or more): tarsi and claws very long ... ovatus, *Macl.*  
 JJ. Size small (less than  $2\frac{1}{2}$  l.): tarsi and claws much shorter.  
 K. Median line of pronotum well impressed ... rubefactus, *Macl.*  
 KK. Median line of pronotum not impressed ... subsquamosus, *Macl.*  
 HH. Propygidium and pygidium devoid of squamiform setæ ...  
 I. Propygidium and pygidium almost without sculpture.  
 J. Prothorax very strongly transverse ... rufipennis, *Macl.*  
 JJ. Prothorax much more feebly transverse ... posticalis, *Blackb.*



- II. Propygidium and pygidium with well defined puncturation.
- J. Head sparsely punctulate ... juvenis, *Blackb.*
- JJ. Head closely punctulate ...
- K. Pronotum conspicuously canaliculate (at any rate near base).
- L. Size moderate (3 l. or more) ... incertus, *Blackb.*
- LL. Size very small (scarcely 2 l.) ... insularis, *Blackb.*
- KK. Pronotum not canaliculate ... vicarins. *Blackb.*
- CC. Basal two joints of hind tarsi equal (or scarcely differing) in length.
- D. Disc of pronotum pilose.
- E. Basal joint of hind tarsi longer than apical spine of its tibia.
- F. The hairs of the upper surface black, or nearly so.
- G. Propygidium (at least of female) closely rugulose and subopaque ... vestitus, *Blanch.*
- GG. Propygidium (at least of female) with coarse sparse punctures, and somewhat nitid ... nigro-umbratus. *Blackb.*
- FF. The hairs of the dorsal surface flaxen ... glabripennis, *Macl.*
- EE. Basal joint of hind tarsi shorter than apical spine of its tibia ...
- F. Size large (5 l.): geminate striæ of elytra well defined ... erythropterus, *Macl.*
- FF. Size much smaller (less than 3 l.): geminate striæ of elytra very feeble ... [(? *Blanch.*)
- \*DD. Disc of pronotum not, or scarcely, pilose; a frill of very conspicuous pilosity all across the front margin.
- E. Pronotum sharply and conspicuously punctulate.
- F. Size fairly large (3½-4½ l.): pilosity of pronotum black ... amabilis, *Blackb.*
- collaris, *Macl.*

\* In *L. puer* there are a few inconspicuous hairs.

- FF. Size small (scarcely 3 l.); pilosity of pronotum fulvous ... .. analis, *Blackb.*
- EE. Pronotum faintly, or scarcely, punctulate.
- F. Size moderate ( $3\frac{1}{4}$  l. or more).
- G. The submarginal geminate striæ of elytra become much deeper close to apex ... .. consanguineus, *Blackb.*
- GG. The submarginal geminate striæ of elytra obsolete towards apex ... .. Sedani, *Blackb.*
- FF. Size small (less than  $2\frac{1}{4}$  l.).
- G. Disc of pronotum with a few scattered hairs ... .. puer, *Blackb.*
- GG. Disc of pronotum glabrous ... .. rotundiformis, *Macl.*
- DDD. Pronotum not pilose either on disc or all across front margin.
- E. Front of clypeus deeply and angularly emarginate ... .. abnormalis, *Macl.*
- EE. Front of clypeus not, or scarcely, emarginate.
- F. Entirely testaceous, except infuscate head ... .. distinctus, *Blackb.*
- FF. Entirely black (unless elytra red).
- G. Propygidium and pygidium densely clothed with adpressed squamiform setæ ... .. tristis, *Blanch.*
- GG. Propygidium and pygidium normal.
- H. Front margin of pronotum entirely glabrous.
- I. Clypeus more produced (in male strongly tridentate): lateral fringe of pronotum whitish. ... .. iridipennis, *Germ.*
- II. Clypeus less produced (in male feebly tridentate): lateral fringe of pronotum brown
- J. Puncturation of propygidium obsolete in front part ... .. gracilipes, *Blackb.*
- JJ. Puncturation of propygidium not obsolete in front part ... .. holosericeus, *Macl.*

- HH. Front margin of pronotum with a pilose frill widely interrupted in middle ... *sericeus, Macl.*
- CCC. Basal joint of hind tarsi distinctly longer than 2nd joint.
- D. Disc of pronotum pilose (in some species more conspicuously so across base and front margin than elsewhere).
- E. Apex (and hind part of sides) of elytra set with short stout bristles ... *asper, Macl.*
- EE. Elytra without marginal bristles.
- F. Elytra black.
- G. Clypeus distinctly tridentate in both sexes ... *atratus, Burm.*
- GG. Clypeus slightly emarginate, not at all dentate ... *ebenus, Macl.*
- FF. Elytra red (blackish, or not, near base).
- G. Front of clypeus with 3 sharp recurved teeth ... *tridentatus, Macl.*
- GG. Front of clypeus feebly and obtusely tridentate.
- H. Elytral puncturation strong (about as in *L. villosicollis, Macl.*) ... *parvidens, Macl.*
- HH. Elytral puncturation notably finer ... *obtusidens, Macl.*
- DD. Pronotum not pilose on disc, but having a fringe of erect hairs all across its front ... *Rothei, Blackb.*
- DDD. Pronotum not pilose on disc, and not fringed across its front.
- E. Front of clypeus having 3 strong sharp recurved teeth ... *Perkinsi, Blackb.*
- EE. Front of clypeus distinctly tridentate: the teeth feeble, blunt, and not recurved.
- F. Pronotum and pygidium dark ... *bituberculatus, Macl.*
- FF. Pronotum and pygidium testaceous red ... *melanocephalus, Blackb.*
- EEE. Front of clypeus not at all tridentate.
- F. A curved impression on either side, on pronotum behind its middle ... *impressicollis, Macl.*
- FF. Pronotum normal.
- G. Size moderate (2½ l.): subopaque; colour subuniform, piceous ... *convexior, Macl.*
- GG. Size very small (less than 2 l.): nitid; colour variegated, partly testaceous ... *laticulus, Blackb.*

- BB. Front tibiæ not tridentate externally.
- C. Pronotum pilose, at least with a fringe of hairs across its front margin.
- D. Elytra pilose.
- E. Elytra very long, quite or almost covering propygidium in both sexes ... .. *alienus, Blackb.*
- EE. Elytra normal (or very short).
- F. Elytra unicolorous.
- G. Front tibiæ very strongly bidentate externally *suavis, Blackb.*
- GG. Front tibiæ not, or scarcely, bidentate externally.
- H. Elytra bearing very long and very coarse sparse white bristles *diversus, Blackb.*
- HH. Elytra clothed with fine soft hairs ... *rotundicollis, Blackb.*
- FF. Elytra bicolorous.
- G. Front tibiæ not toothed externally above the apical projection.
- H. Basal joint of hind tarsi fully half again as long as 2nd joint *ventralis, Blackb.*
- HH. Basal joint of hind tarsi notably shorter in proportion to 2nd joint ... .. *assimilis, MacL.*
- GG. Front tibiæ distinctly bidentate externally.
- H. Basal joint of hind tarsi at least half again as long as 2nd joint ... ..
- I. Pilosity of dorsal surface dark ... *discipennis, Guér.*
- II. Pilosity of dorsal surface almost white ... .. *albohirtus, Mast.*
- HH. Basal joint of hind tarsi very little longer than 2nd joint *canescens, MacL.*
- DD. Elytra glabrous, or with only a few hairs close to base.
- E. Basal joint of hind tarsi not shorter than 2nd joint.
- F. Dorsal surface not uniformly dark.
- G. Elytra pilose in front part ... .. *gravidus, Blackb.*
- GG. Elytra glabrous.
- H. Disc of pronotum clothed with erect hairs.



- I. Basal two joints of hind tarsi equal, or subequal, in length.
- J. Pilosity of pronotum nearly white discoidalis, *Macl.*
- JJ. Pilosity of pronotum dark brown or blackish.
- K. Front tibiae conspicuously bidentate externally ... occidentalis, *Macl.*
- KK. Front tibiae with upper tooth all but non-existent ... luridipennis, *Macl.*
- II. Basal joint of hind tarsi very much longer than 2nd joint ... sericeipennis, *Macl.*
- HH. Pronotum glabrous on disc, but with a fringe of long hairs across front ... cinctipennis, *Blackb.*
- FF. Dorsal surface uniformly dark ... nudipennis, *Germ.*
- EE. Basal joint of hind tarsi notably shorter than 2nd joint ... Palmerstoni, *Blackb.*
- CC. Pronotum glabrous, or at most fringed with hairs on lateral parts of front margin.
- D. Basal joint of hind tarsi fully as long as joints 2 and 3 together ... caviceps, *Blackb.*
- DD. Basal joint of hind tarsi much shorter.
- E. Clypeus very distinctly tridentate in front ... minor, *Blackb.*
- EE. Clypeus not tridentate in front.
- F. No part of dorsal surface (unless head) black.
- G. Basal joint of hind tarsi not longer than 2nd joint.
- H. Front tibiae conspicuously bidentate externally ... pallidus, *Macl.*
- HH. Front tibiae with no distinct tooth above the apical projection.
- I. Flabellum of antennae piceous: head confluent transversely rugulose ... brevipes, *Blackb.*

- II. Antennæ entirely testaceous: head punctulate (not very closely) ... *Blanchardi, Blackb.*
- GG. Basal joint of hind tarsi considerably longer than 2nd joint ... *modestus, Blackb.*
- FF. Dorsal surface (except elytra) black.
- G. Front tibiæ unarmed above the apical projection ... *Leai, Blackb.*
- GG. Front tibiæ distinctly bidentate ... *rotundipennis, Maccl.*
- AA. Antennæ consisting of 8 joints (only).
- B. Front tibiæ tridentate externally.
- C. Basal joint of hind tarsi not longer than 2nd joint.
- D. Pronotum pilose on disc, or at least all across front margin.
- E. Pilosity largely extended to the elytra.
- F. Propygidium and pygidium not coarsely vermiculate-rugulose.
- G. Elytra sparsely punctulate, red (more or less black-margined).
- H. Basal joint of hind tarsi notably shorter than 2nd joint ... *marginipennis, Blanch.*
- HH. Basal 2 joints of hind tarsi equal ... *pilosus, Maccl.*
- GG. Elytra closely punctulate, black (at most reddish near apex).
- H. Front angles of male clypeus acute and directed outward ... *callosus, Maccl.*
- HH. Front angles of male clypeus not acute and not directed forward ... *nigrinus, Germ.*
- FF. Propygidium and pygidium coarsely vermiculate-rugulose ... *sylvicola, Burm. (?Fab.)*
- EE. Elytra glabrous, or with only a few basal hairs.
- F. Sculpture of elytra not transversely rugate.
- G. Male clypeus strongly emarginate, with strong, sharp angles: pronotum of female glabrous on disc ... *ferrugineus, Blanch.*
- GG. Male clypeus scarcely emarginate, and with feeble angles: pronotum pilose on disc in both sexes.

- H. Form broadly ovate; pygidium dark in both sexes ... *ubiquitosus, Macl.*
- HH. Form much narrower; pygidium (and pronotum) bright red in male ... *rubicundus, Macl.*
- FF. Elytral sculpture strongly and conspicuously transversely rugate ... *rugatus, Blackb.*
- DD. Pronotum glabrous (the lateral margins disregarded).
- E. Head, pronotum, and elytra black ... *erythropygus, Blanch.*
- EE. Pronotum (at least partly) and elytra testaceous.
- F. Clypeus subtridentate (distinctly bisinuate) ... *badius, Macl.*
- FF. Clypeus not bisinuate.
- G. Hind angles of pronotum quite defined.
- H. Puncturation of pronotum quite sparse... *monticola, Macl. (? Fab.)*
- HH. Puncturation of pronotum close ... *fallax, Blackb.*
- GG. Hind angles of pronotum rounded off (non-existent) ... *atriceps, Macl.*
- EEE. Entirely black, except the elytra, which are testaceous (black bordered) ... *micans, Macl.*
- CC. Basal joint of hind tarsi much longer than 2nd joint ... *criniger, Macl.*
- BB. Front tibiæ with less than 3 external teeth.
- C. Front tibiæ conspicuously bidentate externally ... *lætus, Blackb.*
- CC. Front tibiæ with no distinct tooth above the apical projection ... *lævatus, Macl.*
- AAA. Antennæ consisting of 7 joints only
- B. Pronotum not confluent and asperately punctulate.
- C. Pronotum nitid: its longitudinal channel deep and entire.
- D. Pronotum sparsely punctulate ... *mysticus, Blackb.*
- DD. Pronotum closely punctulate ... *globulus, Macl.*
- CC. Pronotum not as C.
- D. Surface of pronotum entirely clothed with long pilosity ... *insolitus, Blackb.*
- DD. Pronotum glabrous, except on sides and across front margin.
- E. Surface of propygidium even ... *lævis, Blanch.*
- EE. Surface of propygidium strongly gibbose in middle ... *tuberculatus, Lea (?)*
- DDD. Pronotum entirely glabrous (except lateral fringe) ... *opacicollis, Macl.*
- BB. Pronotum confluent and asperately punctulate ... *squamiger, Macl.*

## FIRST GROUP (A, B, C, D, E, OF TABULATION).

The species under this heading form part of a natural group with which, however, some species with very different antennal structure (AA, B, C, D, E, of tabulation) are so closely allied that they ought to be placed in it to make it complete as a natural group. Sir W. Macleay placed them all together, and attributed similar antennal structure to them all. There are strongly marked sexual characters in the clypeus of all of them, and in the front tarsi of more than half, sexual characters in the antennæ moderately strong, in the abdomen almost none, vestiture of dorsal surface and structure of hind tarsi uniform, or but slightly varying specifically, structure of front tibiæ very uniform. The following are notes on some of the species:—

*L. Adelaide*, Blackb., is *L. comatus*, Macl., although the description of *comatus* is extremely misleading, being founded on a colour var. such as I have not seen, and said to resemble *L. marginipennis*, Blanch., which is a species of the same natural group, but by no means one of the most like it superficially. Macleay had a peculiarly coloured example before him, and gave a by no means felicitous description of it under the name *comatus*.

*L. flavopilosus*, Macl. This species was described from Gayndah specimens, as also was *fulvohirtus*, Macl. Between the two descriptions I find absolutely not one differential character except that the pilosity of one is called "pale red" and of the other "yellowish." In the Australian Museum I find one specimen (male) of *flavopilosus* and two (female) of *fulvohirtus*, doubtless including the types. They are all from one locality (Gayndah), and do not seem to differ *inter se* except in sex.

*L. xanthotrichus*, Blanch. Macleay says that the basal two joints of the hind tarsi are equal. The specimens so named in the Sydney Museums—as also in my own collection—have hind tarsi with the basal joint (though longer than is usual in this group) distinctly shorter than the second joint. The author of the name does not mention the hind tarsi.

*L. ater*, Macl. A male (unique) in the Macleay Museum is evidently the type of this species. Excessively close to *phænicopterus*, Germ., and attributed to the same region (S. Australia) as that species. It is notably larger than any specimen that I have seen of ordinarily coloured *phænicopterus*, nor have I seen *phænicopterus* (of ordinary size) with elytra dark piceous in colour as they are in *ater*. The geminate striæ of the elytra are more strongly marked than in



ordinary examples of *phænicopterus*. *L. ater* may prove to be a good species, but is possibly only an aberrant specimen of *phænicopterus*.

*L. nitidipennis*, Macl. A female (unique) in the Macleay Museum is, no doubt, the type of this species. It is in bad condition, and seems to me to be certainly the female of *L. ater*, Macl. It is of the size and colouring of a typical example of *phænicopterus*, Germ., but differs from the female of that species by the more strongly marked geminate striæ of its elytra, and the more abruptly narrowed front portion of its clypeus. Like *phænicopterus* and *ater* it is from S. Australia.

*L. Mitchelli*, Macl. A male (unique) in the Macleay Museum, is, no doubt, the type of this species. I do not find any character to distinguish it from *L. villosicollis*, Macl., except the slight difference (indicated in the preceding tabulation) in the form of its clypeus. This difference, however, remoteness of locality being given due weight, seems to indicate probable specific validity.

#### SECOND GROUP (A, B, C, D, EE, OF TABULATION).

Differs from the preceding group only by the elytra of its members being glabrous, or with only a few hairs close to the base.

*L. Mastersi*, Macl. Among the specimens standing under this name and *L. Germari*, in the two Sydney museums, it is impossible to identify the actual types. The distinctions indicated in Macleay's note on *Mastersi* (it can hardly be called a description) are too slight to be seriously regarded. In *Germari* the male clypeus is said to be nearly quite truncate, the angles not very acute; in *Mastersi*, "slightly emarginate in front, and acutely angled." In *Germari* the median line of the pronotum is said to be "quite traceable," and in *Mastersi* not traceable. Slight differences in puncturation and vestiture are mentioned. Differences in the inner apical spur of the front tibiæ and the degree of dilatation of the male front tarsi are also mentioned. The last-mentioned character, if it were strongly marked and constant, would, no doubt, be of importance: but, after careful study of the specimens pinned into the two labels ("*Germari*" and "*Mastersi*"), in the Macleay Museum—among which presumably are the types—I have failed in finding two specimens that present this difference *inter se*, or even that differ *inter se*, as *Germari* and *Mastersi* should do in respect of the other slight characters. I must, therefore, regard them as but one species, and as "*Germari*" stands before "*Mastersi*" in Mac-

leay's Monograph, and is described (while *Mastersi* is not), the species must bear the name "*Germari*."

*L. capillatus*, MacL. Here, again, the identification of the type is mere guesswork. It is supposed to be in the Macleay Museum, where I find two specimens (male and female), pinned into a label bearing the name *capillatus*. The female is in very bad condition, and does not seem to be specifically identical with the male, having strongly pilose elytra, while the elytra of the male are glabrous. The specimens named *capillatus* in the Australian Museum are identical (so far as can be judged in dealing with bad specimens) with the female in the Macleay Museum. As it was a male that Macleay described, I take it that the male in the Macleay Museum is probably the real type, and I have accordingly treated it as such. It is much like *Germari*, MacL., but is very much smaller, with different male characters (*i.e.*, clypeus much narrowed from base to apex, and front tarsi only very slightly thickened). Macleay's description of *capillatus* is not definite enough to assist identification of type. It may be added that a male standing in the Australian Museum as *capillatus* differs from the male in the Macleay Museum by its elytra being pilose and with a dark basal border, and by its front tarsi being strongly thickened.

*L. dispar*, Blackb. I place this species in the second group only with hesitation, since the basal joint of its hind tarsi is not much shorter than the second joint, and consequently it is somewhat intermediate between this group and the fifth, from the species of which it differs in the following respects, *inter alia*:—From *restitus*, *nigro-umbratus*, and *glabripennis*, by the basal joint of its hind tarsi, notably shorter absolutely (as well as in proportion to the second joint), from *amabilis* by much larger size and quite different colouring; and from *erythropterus* by its pronotum considerably more closely punctulate, and its elytra widely dark at the base.

### THIRD GROUP (A, B, C, DD, OF TABULATION).

The front of the pronotum entirely bordered with a frill of erect hairs renders this group easily recognisable among the *Liparetri* which have three somewhat equally spaced external teeth on their front tibiæ, nine-jointed antennæ, and the basal joint of their hind tarsi decidedly shorter than the second joint. The last-named three characters are all well defined in all of them, except that in *L. lugens* the difference in the length of the joints of the hind tarsi is somewhat feeble. If that species were regarded as having those joints subequal it would be brought into the sixth group, from all

the species of which (not greatly differing in size) it differs by its being devoid of iridescence, and having its pronotum subopaque and closely rugulose.

*L. Kreusleræ*, Macl. The pronotum of this species is stated by its author to be "free from hair except on the ateral margins." That, however, is a mistake. There are specimens in the Macleay Museum (bearing the name), no doubt including the type, and agreeing with the description in all other respects, but having the apical margin (as well as the lateral margins) of the pronotum pilose. I have, therefore, no hesitation in correcting Sir W. Macleay's description in that respect.

*L. angulatus*, Macl. Two specimens (male and female) are pinned into the label bearing this name in the Macleay Museum, and are doubtless the types. The species is one I have not seen elsewhere. It is near my *L. fimbriatus*, but differs from it *inter alia* by its strongly pruinose and iridescent elytra.

#### FOURTH GROUP (A, B, C, DDD, OF TABULATION).

This group is a somewhat heterogeneous assemblage of species, among which there is considerable variety of facies, etc. The characters that I have indicated as common to the group are well marked in all its species, with the exception that a few of them (notably the female of *L. aridus*, Blackb.), are somewhat intermediate between the fourth and seventh groups, owing to the basal joint of the hind tarsi being only a little shorter than the second joint. The use of this character in the hind tarsi is too valuable in dealing with a long series of species to be discarded on account of these doubtful cases; but it seems necessary to furnish a note on each of the latter showing how the species differs (disregarding the hind tarsi) from its allies in the seventh group.

*L. aridus*, Blackb. The entirely testaceous colour of this species prevents its confusion with any member of the seventh group except *distinctus*, Blackb. The basal joint of the hind tarsi in the latter is quite fully as long as the second joint, the general build is much more robust than in *aridus*, the prothorax much more narrowed in front and much less finely punctulate on its upper surface, its colour a much less pallid testaceous, etc.; also it has remarkable sexual characters on the abdomen which are wanting in *aridus*.

*L. picipennis*, Germ., can scarcely be confused with the seventh group, as the basal joint of its hinder tarsi is quite distinctly (though not very much) shorter than the second joint. It presents the unusual character of a row of erect hairs widely interrupted in the middle on the front margin

of its pronotum. The presumable types of *L. nitidior*, Maccl., and *L. obscurus*, Maccl., are mere colour vars. of *piripennis*.

*L. rubefactus*, Maccl., is in no danger of confusion with the seventh group, but it is desirable to note that its colour is extremely inconstant, the elytra propygidium and pygidium varying from a rusty testaceous, or a distinctly red, colour to black. The darker specimens are for the most part males.

*L. subsquamosus*, Maccl. A single specimen—no doubt the type—is pinned into the label bearing this name in the Macleay Museum. It is extremely close to *L. rubefactus*, Maccl., especially the dark examples of that species: but the difference in the sculpture of the pronotum, in combination with great distance of *habitat*, justify the retention (at any rate, provisionally) of a separate name for this insect. It is difficult to understand why Macleay placed *rubefactus* and *subsquamosus* in different sections of *Liparetrus*, as having the "upper surface entirely glabrous" in the case of the former, and the "body squamose" in the case of the latter. The (presumable) types of the two do not differ at all in that respect from each other.

*L. rufipennis*, Maccl. The presumable type of this insect (in the Macleay Museum) is devoid of distinct puncturation on the propygidium and pygidium—a very unusual character in *Liparetrus*. Macleay does not mention it, unless the phrase "pygidium glabrous" is intended to refer to it.

*L. ovatus*, Maccl. I have examined the presumable type of this species in the Macleay Museum. There are specimens in the collection of Mr. H. J. Carter with their elytra black, which I cannot distinguish otherwise from the type. They are from W. Australia (the original locality).

*L. posticalis*, Blackb. This species is certainly rather close to that discussed above as *L. rufipennis*, Maccl., but I believe it to be distinct, although the examination of more specimens from the same locality (Port Darwin) would be desirable to settle the point finally. It is of very evidently narrower and more elongate build than any of the numerous specimens that I have seen of its ally, the prothorax especially being longer in proportion to the width. There are also differences in the puncturation of the head, the punctures of the clypeus being more coarse and sparse and those of the frons distinctly asperate, which they are not in the Queensland insect, and the tarsi are manifestly less robust than in either sex of that species. I believe the type to be a female.

*L. juvenis*, Blackb. In my description of this species I called the basal joint of the hind tarsi "*vix brevior*," as compared with the second joint. It is, however, sufficiently



shorter to place the species in my fourth group rather than the seventh. Apart from that character, its uniform pale colour (except on the head and sterna) distinguishes it readily from all the species placed in the seventh group.

FIFTH GROUP (A, B, CC, D, OF TABULATION).

This group differs from the second by the much greater length of the basal joint of the hind tarsi in comparison with the second joint. The following are notes on some of its species:—

*L. pruinus*, Burm. Macleay did not know this species. I have found in Mr. Griffith's collection two examples (from Tasmania, the original locality), which agree very well with Burmeister's description. There appears, on first thoughts, to be a serious discrepancy from Burmeister's description, which attributes to *pruinus* hind tarsi having the basal joint longer than the second joint, whereas I have placed the insect in a group having those joints equal, or almost equal. The fact is, Burmeister did not separately describe the hind tarsi of each species, but made his primary division of the genus into species having (*a*) the basal; or (*b*) the second joint longer than the other, and recognised no intermediate group, and by placing *pruinus* in (*a*) he indicates the basal joint as the longer. If the basal joint of the species before me be examined (with care that the whole length of the joint be in sight) it is seen to be slightly longer than the second joint, so that in Burmeister's arrangement it would properly stand in (*a*), but the difference is so slight between the length of the joints that they must certainly be called sub-equal. In the Macleay Museum there is no *Liparetrus* ticketed "*pruinus*," but two examples (from Tasmania), of the insect referred to above are ticketed "*vestitus*, Blanch." I have no doubt of their being correctly named, and of *vestitus* and *pruinus* being synonyms. In his monograph Macleay places *vestitus* in his section with the "body squamose," but the specimens in the Macleay Museum (presumably those Macleay described) present no such character, nor does Blanchard attribute squamosity to *vestitus*. Blanchard's figure in the "Voyage au Pôle Sud," is evidently the figure of this insect, and the *habitat* is given as "Tasmania," although in Blanchard's "Cat. Coll. Ent." it is "Nouv. Holl." There are in my collection examples of a *Liparetrus* from New South Wales that I cannot distinguish from the Tasmanian examples of *vestitus* except by their colouring, which is very variable. Unfortunately, all the Tasmanian specimens that I have seen are females, so I cannot be sure of their identity with those from New South Wales. In some females of the

latter the dark marginal colouring is absent from the elytra, while the single male in my possession has elytra almost entirely piceous, with only a small area of reddish tone on the disc. The front tarsi of this male are very much longer (but scarcely thicker) than those of the female.

*L. nigro-umbratus*, Blackb. In my description of this species (Tr.R.S.S.A., 1887, p. 22) I mentioned the size of the upper external tooth of the front tibiæ as probably a sexual character. I am now, however, of opinion that that is not so, that in the case (at any rate of most) of the species of *Liparetrus*, differences in the robustness of the teeth on the front tibiæ are not sexual, and that I do not know the male of *L. nigro-umbratus*.

#### SIXTH GROUP (A, B, C, DD, EE, OF TABULATION).

The relation of this group to the third is similar to that of the fifth to the second.

*L. collaris*, MacL. My *L. maurus* is identical with this insect. When I described it (P.L.S.N.S.W., 1892, p. 99) I stated my reasons for considering it distinct from *collaris* (which I knew only by Macleay's description). I have now examined the presumable type (in the Macleay Museum) and find that the two are specifically identical. The structure of the hind tarsi being disregarded, *L. collaris* is distinct from all those resembling it in colour, of the third group (which has similar vestiture), by the form of its male clypeus—notably emarginate in front, and not having the front angles acute.

#### SEVENTH GROUP (A, B, CC, DDD, OF TABULATION).

The following are notes on species that belong (at least probably) to this group, which has characters similar to those of the fourth group, except in respect of the hind tarsi.

*L. iridipennis*, Germ. There is no greater difficulty in studying *Liparetrus* than the identification of this species (described A.D. 1848) without examination of the type, which, if still in existence, is, no doubt, in one of the European collections. As far as Germar's description is concerned it applies very accurately to *L. senex*, Blackb.—a common South Australian species, of which I have seen examples from, among other places, the original locality of *iridipennis*. Unfortunately, there is a very important omission in Germar's description, for it contains no reference to the structure of the hind tarsi. Burmeister redescribed *iridipennis*, and placed it in his group of *Liparetri* having the basal joint of the hind tarsi longer than the second joint. For the reason noted above (under *L. pruinus*, Burm.), this does not seem to me

absolutely incompatible with the identification of his *iridipennis* with *senex*, although in *senex* the basal two joints are all but equal—in the male the basal joint, in the female the second, being just barely shorter than the other (Germar and Burmeister both describe the female only). But, unfortunately for that identification Burmeister adds a note that Germar gives the wrong size for his insect, and that it is (not  $3\frac{1}{2}$  l., but)  $2\frac{1}{2}$  l. long. The smallest specimen that I have seen of *L. senex* is  $3\frac{1}{2}$  l. The question, therefore, arises as to the grounds on which Burmeister made this assertion (giving the same size for *iridipennis* that he assigned to *discipennis*, Guér., a very much smaller insect than *senex*). Without definitely asserting it, he certainly seems to imply that he had seen Germar's type. Nevertheless, I am of opinion that his *iridipennis* is identical with my *senex*, and that, if his measurement is correct, it was founded on an exceptionally dwarfed example. Burmeister's accuracy in respect of this species is certainly discounted by his having represented Blanchard's *sylvicola* as a synonym of *iridipennis*, which is far from a correct statement, Blanchard having merely placed in his descriptive catalogue *sylvicola*, Fab. (without a description, but with the mention of Tasmania as the locality of the specimens before him), and appended some synonymy, at the end of which he places "*iridescens*, Germ." (doubtless a misprint). I feel extremely confident that the Tasmanian specimens which Blanchard catalogued as *sylvicola* were not *iridipennis*. *Sylvicola* is a common species in Tasmania, and I have much negative evidence (from my own collecting, etc.), that *iridipennis* is not found on that island. It seems practically certain that Blanchard's reference to *iridipennis* expresses no more than that author's conjecture that *iridipennis* is identical with *sylvicola*, which is certainly not the case, though that is not to the point here. Macleay's treatment of *iridipennis* is most unsatisfactory. In the Macleay Museum two specimens are pinned into the label "*iridipennis*," one of which is my *senex*, the other my *caviceps* (the former with the front tibiæ tridentate and the basal two joints of the hind tarsi subequal, the latter with the front tibiæ bidentate and the basal joint of the hind tarsi very much longer than the second). Macleay's description of *iridipennis*—which has always been a puzzle to me, appearing to describe a South Australian *Liparetrus* very different from any that I have seen—is evidently a jumble of these two specimens, founded on the front tibiæ of my *senex* and the hind tarsi of my *caviceps*. I may add that my treatment of *senex* as a species distinct from *iridipennis* was founded on its wide divergence from Macleay's redescription, and that author's assurance that specimens of it

which I submitted to him were certainly not *iridipennis*. The real identity of *iridipennis* cannot be settled finally without examination of Germar's type: owing to the deficiency of Germar's description, and Burmeister's statement that Germar's measurement is seriously incorrect, it is possible that *iridipennis* is my *gracilipes*, or my *caviceps*, or the species that I regard as *nigrinus*, Germ.: but as my *senex* agrees best on the whole with Germar's description, and is certainly the most plentiful in the locality where Germar's types were collected, the evidence is certainly in favour of my *senex* being the true *iridipennis*. At any rate, it is now clear that Macleay's redescription of *iridipennis* depicts a species that does not exist.

*L. gracilipes*, Blackb. This species is abundantly distinct from *senex*, Blackb, but it is, as stated above, not certain that it may not be the true *iridipennis*, Germ. Burmeister's *iridipennis* is, I think, certainly not *gracilipes*, as the basal joint of the hind tarsi of the latter is in both sexes a trifle shorter than the second joint. Compared with *iridipennis*, Germ. (*senex*, Blackb.), this species is very similarly coloured, except that the hairs fringing the pronotum laterally are much darker ("dark brown," however, would characterise them better than "black," the word I used in the original description), and the iridescence of the surface is less pronounced; the tarsi are less robust in both sexes; the clypeus is notably less produced in both sexes and less evidently tridentate (male) or sinuate (female), although there is some variability in this respect, some females of both having the clypeus not very far from evenly truncate; the propygidium is very differently sculptured, having the hind part in both sexes more strongly punctulate and impressed with two more or less distinct longitudinal foveæ (these, in some examples, arched so as to meet at both ends and form a ring), between which the surface is more or less gibbous, and the front part abruptly devoid of punctures and highly nitid [in *iridipennis* (*senex*, mihi) the propygidium is in front opaque, with fine, very close puncturation, which becomes continuously stronger and less close hindward, and its surface is even]. In the male of *gracilipes* the middle part of the basal two ventral segments is occupied by a very dense tuft of erect, soft, whitish hairs, which is wanting in its ally.

*L. simillimus*, Macl. In the Macleay Museum two specimens (one of them presumably the type) are pinned into the label bearing this name. Unfortunately, their sex cannot be confidently determined, as they have both lost their front tarsi, but, judging by the form of the abdomen, I take them to be males, and I think they are males of *abnormalis*, Macl.,



of which the other specimens that I have seen (including the presumable type in the Macleay Museum) are females.

*L. latiusculus*, Macl. The presumable type of this species (female) is in the Australian Museum. I can find no non-sexual difference whatever between it and the presumable type (male) of *L. sericeus*, Macl., also in the Australian Museum. It appears to me doubtful whether the specimen pinned into the label "*latiusculus*," is really in its proper place, as Macleay's measurements of that insect indicate a considerably smaller species, but as *latiusculus* is practically undescribed (being merely briefly compared with *picipennis*, Germ.), it is incapable of identification unless the specimen in the Australian Museum be accepted as the type.

*L. holosericeus*, Macl. The presumable type of this species is in the Macleay Museum. It is closely allied to *L. iridipennis*, Germ. (*senex*, Blackb.), and *gracilipes*, Blackb., but, *inter alia*, differs from both of them by its clypeus without any tendency to sinuation.

#### EIGHTH GROUP (A, B, CCC, D, OF TABULATION).

The following notes are on species belonging to this group, which differs from the first and fifth groups by the structure of its hind tarsi, but agrees with them in other characters, *i.e.*, vestiture, etc.

*L. asper*, Macl. The presumable type of this species is in the Macleay Museum, and the same species also is ticketed "*sylvicola*" in the same Museum. If the specimen pinned into the label "*asper*" is really the type, it is incorrectly described in Macleay's monograph, where the vestiture of the pronotum is stated to be "a fringe of long, erect, black hairs on the base, apex, and sides." Owing to that statement I assumed that the species was not *asper*, and described it (P.L.S., N.S.W., 1891, p. 482), as *spretus*. It is very possible that the presumable type is not the real one, but nevertheless, as it now stands in the place of the type, it seems better to admit its claim, and regard *spretus* as a synonym, than to adhere to the description and regard *asper* as a species known only by a brief description, and very likely non-existent. For reasons stated under the name *sylvicola*, Fab., I am quite confident that Macleay was mistaken in ticketing *asper* (*spretus*, mihi.), as *sylvicola*.

*L. atratus*, Burm. In his monograph Macleay expresses doubt as to his identification of this species, and merely quotes Burmeister's description. I have specimens from Tasmania (the original locality), which agree perfectly with Burmeister's description, and are certainly this insect. In both the Sydney Museums *iridipennis*, Germ. (*senex*, Blackb.) stands

as *atratus* (the same species also standing, along with *caviceps*, Blackb.), under its right name). I do not find the true *atratus* in the Macleay Museum, but in the Australian Museum an example of it (and also two of *concolor*, Er.), is labelled "*sylvicola*," which latter name (as noted above) is applied in the Macleay Museum to *asper*, Macl. Apparently it was the specimen of *atratus* labelled "*sylvicola*," which Macleay described in his monograph as *sylvicola*.

*L. tridentatus*, Macl. The presumable type of this species, and also that of *L. acutidens*, Macl., are in the Australian Museum. I can find no difference whatever between them. After his description of *L. acutidens*, Macleay says that it differs from *L. tridentatus*, "as the description will show, very widely." Placing the two descriptions side by side, however, I have failed to find even *one* definite difference between the two, the nearest approach to it being that the elytra of *tridentatus* are called "subsericeous red," and of *acutidens* "iridescent yellow." I do not find any conspicuous difference, even in respect of colour, between the presumable types.

*L. parvidens*, Macl. The presumable type of this species is in the Australian Museum. It somewhat closely resembles *obtusidens*, Macl., but is probably a valid species, as its elytral puncturation is very notably coarser than in that species, and its *habitat* (Cleveland Bay) is very far distant from that of *obtusidens*.

#### NINTH GROUP (A, B, CCC, DD, OF TABULATION).

This group differs from the eighth by the absence of pilosity on the disc of its pronotum, and from the tenth by the presence of a fringe of erect hairs all across the front of that segment. I know only one species (*L. Rothei*, Blackb.) which can be referred to it.

#### TENTH GROUP (A, B, CCC, DDD, OF TABULATION).

The following are notes on species appertaining to this group, which resembles the preceding two groups except in respect of vestiture of pronotum.

*L. bituberculatus*, Macl. The female is usually much darker in colour than the male.

*L. convexior*, Macl. Two specimens (one of them, presumably, the type) are pinned into the label bearing this name in the Macleay Museum. I have not seen the species elsewhere.

#### ELEVENTH GROUP (A, BB, C, D, OF TABULATION).

This group differs from all the preceding by the front tibiae of its species not tridentate externally. The following are notes on species belonging to it.

*L. assimilis*, Macl. The presumable type is in the Macleay Museum. I think it a male. Its apical ventral segment does not differ materially from that of male *discipennis*, Guér.

*L. discipennis*, Guér. Specimens from almost all parts of southern Australia and from Tasmania stand in collections under this name. Macleay gives New South Wales and South Australia as its *habitat*. Whether the specimens from Tasmania and South Australia are specifically identical with those from Sydney I feel rather doubtful. It is too variable a species in colouring for great importance to be attached to such distinctions as greater or less width of dark margins of elytra in local races; but the opportunities I have had of examining sexual characters point to difference in the ventral characters of the male in at any rate Tasmanian examples. Unfortunately, there is only a single male among those I have from Tasmania, and I do not think it safe to found a new species on the decided (though not very great) difference between the sculpture of its apical ventral segment and the corresponding segment in the few male Sydney specimens before me. The study of a longer series might not improbably establish specific difference as constant. The species that Germar describes as *discipennis* seems, from the colour of its vestiture, to be that which Macleay named *canescens*.

*L. montanus*, Macl. I have examined the presumable type of this species, unique in the Australian Museum, and can find no difference whatever between it and *L. discipennis*, Guér. It seems to be a male; at any rate, its apical ventral segment is quite like that of male *discipennis*.

*L. canescens*, Macl. I have examined the presumable type in the Macleay Museum. It is a common South Australian insect, and very distinct from *discipennis*, Guér. Besides other differences the apical ventral segment of its male is nitid and almost punctureless, with a strong, obtuse carina placed transversely across its middle, the corresponding segment in male *discipennis*, from Sydney, having an even surface, on which there is fine puncturation, mixed with some coarse piliferous granules.

*L. albohirtus*, Macl. Two specimens are pinned into the label bearing this name in the Macleay Museum. One of them is obviously some very different insect—the other presumably the type. Macleay says that the front tibiæ are “scarcely bidentate,” the upper tooth being “nearly obsolete.” I find, however, that although the upper tooth is small (as in *discipennis*, Guér., and *canescens*, Macl.), it is perfectly well defined in the type.

## TWELFTH GROUP (A, BB, C, DD, OF TABULATION).

Resembles the preceding group in respect of most of its characters, but has elytra glabrous, or with only a little pilosity near base. The following notes relate to members of this group.

*L. discoidalis*, Macl. This and the next two species are very distinct, *inter se*, but with few distinctive characters that lend themselves readily to tabulation. *Discoidalis* is represented in the Macleay Museum by two specimens (one of them presumably the type). Their elytra are remarkably coloured, there being only a very narrow black border, except at the apex, which is very widely of a deep black colour, so that to a casual glance they seem to have bright red elytra with a wide, apical black fascia. In one specimen the pronotum is partially red. The front tibiæ are distinctly bidentate externally.

*L. occidentalis*, Macl. Two specimens are pinned into the label bearing this name in the Macleay Museum. There is, however, a difficulty in accepting either of them as the true type, for Macleay says that the hind tarsi were wanting in the specimen described, which is not the case with either of those in the Museum. Nevertheless, as they are distinct from any other species that I can find to have been described, and agree with the brief description, they may fairly be regarded as correctly named. They resemble *discipennis*, Guér., in colouration, but differ from it widely by, *inter alia*, glabrous elytra and basal two joints of hind tarsi subequal. It is near *discoidalis*, Macl., undoubtedly, but with very much darker vestiture, and moreover the colouring of the elytra in the two examples of *discoidalis* is so conspicuous and unusual that there can be little doubt of its being a specific character. I think one of the specimens of this insect (as also of *discoidalis*) is a male. The apical ventral segment in both is not much different from that of male *discipennis*.

*L. luridipennis*. A specimen bears this name in the Australian Museum, and agrees well with the description except in the pilosity of the pronotum being somewhat darker than "fulvo-villose" would lead one to expect. Its facies is very different from that of the preceding two species, the size being notably larger and the form more robust. The head is more massive, with the clypeus wide and subsemicircular (not unlike that of *rufipennis*, Macl.)—not at all of the *discipennis* type.

*L. lanaticollis*, Macl. The presumable type of this species is in the Macleay Museum. It is identical with my *L. Palmerstoni*. Both names were proposed in P.L.S., N.S.W., 1888. Macleay's name is a month later than mine.



## THIRTEENTH GROUP (A, BB, CC, OF TABULATION).

Distinguished from the preceding group by the absence, or nearly so, of vestiture on the pronotum. The species are all fairly recognisable, and only one remark seems called for here, viz.:

*L. simplex*, Blackb. This name must become a synonym of *rotundipennis*, MacL. When I described the species I drew attention to its being near Macleay's insect, but I judged from the description of the latter that it was distinct, principally from the absence of two minute tubercles on the head, which Macleay mentions, and from the elytral puncturation being by no means "faint." Comparison with the presumable type in the Macleay Museum has, however, satisfied me that the two are identical, the tubercles on the head being either sexual or accidental, and the elytral puncturation being not quite correctly described by Macleay. Macleay's measurement, moreover, is incorrect, the length being  $2\frac{1}{2}$ -3 l.

## FOURTEENTH GROUP (AA, B, C, D, E, OF TABULATION).

Macleay places all the species of this group among *Liparetri* having nine-jointed antennæ. As a fact, they are so closely allied to the species of the first group that, so far as I have observed, the antennal structure alone distinguishes the one aggregate from the other. It seems clear that Macleay must have examined the antennæ of a few species that fall into my first group, and then assumed a similar structure in the rest of the species that, the antennæ being disregarded, would be properly associated with them. Even on that supposition, however, it is difficult to understand the positive assurance he manifests on the subject, for of *hirsutus*, Burm., he says that the description seems to refer it to the aggregate containing *phænicopterus*, Germ., but attributes only eight joints to its antennæ, which, he adds, "seems impossible." The following are notes on the species of this group and on their synonymy:—

*L. marginipennis*, Blanch. There seems to me to be no doubt that Blanchard was mistaken in placing this species among those with nine-jointed antennæ. Blanchard's description (which is a fairly detailed one), and his remark on the close resemblance of *marginipennis* to his *xanthotrichus* seem to forbid any doubt that he had before him a well-known species, which is common in New South Wales, and stands in Australian collections generally under the name *marginipennis*; but there are certainly only eight joints in its antennæ. Probably Blanchard counted the joints in the antennæ of *xanthotrichus*, and assumed that a species so closely resembling



it as *marginipennis* does would have similar antennæ. This species stands in the Macleay Museum as *marginipennis*, Blanch. The presumable type of *L. nigrohirtus*, Macl., in the Macleay Museum, is also *marginipennis*.

*L. hirsutus*, Burm. It seems clear that this species is identical with *marginipennis*, Blanch. The descriptions present no definite difference except in Burmeister stating the number of joints in the antennæ as "only eight," which, as remarked above, is correct. Burmeister's omission to identify *marginipennis* may be accounted for by his remark that he is unable to bring Blanchard's *Liparetri* into his work because their author has not described their tarsi.

*L. pilosus*, Macl. I have examined the presumable type in the Australian Museum. Its antennæ consist of eight joints only. It is extremely close to *L. marginipennis*, Blanch., but differs by the basal two joints of its hind tarsi being almost equal, *inter se*.

*L. callosus*, Macl. I have examined the presumable type in the Australian Museum, the colouring of which is very unusual in the genus. Its antennæ have only eight joints. The species seems to be variable in respect of colouring, as other specimens before me (otherwise identical) are without the red mark on the elytra.

*L. (Melolontha) sylvicola*, Fab. This species is one of the difficult *Liparetri* for identification. Its first assignment to *Liparetrus* seems to be in Blanchard's catalogue, where, however, it is not redescribed. Burmeister redescribed it, and I think his identification must be accepted as reliable, inasmuch as he expressly stated that he had examined the Fabrician types of *Melolonthides* in London, among which that of *sylvicola* was, no doubt, included. Then Macleay followed with a redescription, which, however, is evidently founded upon *L. atratus*, Burm. In the Australian Museum two specimens of *L. concolor*, Er., and one of *L. atratus*, Burm., are pinned into the label "*sylvicola*, Fab.," and in the Macleay Museum, *L. asper*, Macl., stands under that name as well as under the name *asper*. In his monograph, Macleay described Burmeister's *sylvicola* (incorrectly in respect of the antennæ, by placing it among the species having nine-jointed antennæ), under the name *salebrosus*, and without citing any reason for rejecting Burmeister's name. The complications, however, do not stop here, unfortunately: for *sylvicola* is an insect the sexes of which are so different that they have been treated as distinct species. *Sylvicola*, Burm., is the female, and the male was described by Blanchard as *basalis*. Here, again, Macleay has confused matters by describing a totally different species as *basalis*, Blanch. I myself in my earliest

memoir on *Liparetrus* neglected to verify this determination of Macleay, and, assuming that *basalis*, Blanch.,<sup>1</sup> was rightly identified by Macleay, redescribed the true *basalis* as *Macleayi*.

The synonymy which I believe to be correct, then, stands thus:—

*L. sylvicola*, Fab., Burm. (*nec.*, MacI), fem.

*salebrosus*, MacI., fem.

*basalis*, Blanch. (*nec.*, MacI.), mas.

*Macleayi*, Blackb., mas.

I do not think that any one comparing Macleay's description of *salebrosus* with Burmeister's of *sylvicola* can doubt that they refer to the same insect, which is a remarkably isolated species, and very common in southern Australia. As to Macleay's "*basalis*, Blanch.," it is an *Automolus*, and is found in Victoria and Tasmania. Unfortunately, Blanchard's description of *basalis* is an exceptionally meagre one, and it was perhaps not unnatural that Macleay should have referred it to the insect he did if he had not the genuine *basalis* before him. In fact, it is chiefly a matter of colouring and sculpture (although the two insects differ very widely in respect of important characters that Blanchard does not refer to). Both occur in Tasmania commonly. Blanchard says of *basalis*, "elytris fusco-rubris, basi late nigris," which exactly fits the male of *sylvicola*, Burm. Macleay says of the species that he regards as *basalis*, "elytra brownish-red, the base blackish," which aptly describes his *basalis*, but not the male of *sylvicola*, the former having a mere blackish infuscation across the base of the elytra, the other a wide basal fascia, well defined, and of deep black colour. As to sculpture, Blanchard says of *basalis*, "prothorace scabroso x x elytris punctato-scabrosis x x pygidio scabroso," which very correctly indicates the vermiculate-rugulose sculpture of *sylvicola* (as characterised by Burmeister, who calls it "rugoso-varioloso"), and of *salebrosus*, MacI., which its author describes as "coarsely variolose-punctate." No other *Liparetrus* known to me in nature or description has any such sculpture. *L. basalis*, MacI. (*nec.*, Blanch.), is quite differently sculptured. Macleay calls it "rugosely punctate," a term which he applies (correctly enough) to the sculpture of numerous other *Liparetri*, corresponding to the "rugoso-punctatus" which Blanchard applies to the sculpture of various *Liparetri*.

As to the identity of *L. sylvicola* (Fab.), Burm., and *basalis*, Blanch. (*Macleayi*, Blackb.), as sexes of one species, I can state that I have taken them paired in Tasmania subsequently to my describing *Macleayi*.

It is, perhaps, best to add that nothing short of Burmeister's strong implication that his description of *sylvicola*

is founded on an examination of the specimen that stands as the type would justify the acceptance of his identification as correct, inasmuch as Fabricius's description says, "capite et thorace glabris." If Burmeister's *sylvicola* were regarded as distinct from that of Fabricius, the name of Burmeister's species would have to be changed to *basalis*, Blanch.

*L. nigrinus*, Germ. The species that stands under this name in the Macleay Museum, and that Macleay describes under this name, is a common South Australian insect, and it does not agree, in an important character, with Germar's description, inasmuch as its front tibiæ are tridentate externally, whereas Germar says, "tibiis bidentatis." I believe, however, that in Germar's description "bidentatis" must be a misprint, as in other respects that description satisfactorily enumerates the characters of the species in question. Moreover, I have not seen in any collection any species with bidentate front tibiæ that could possibly be *nigrinus*, and it is hardly likely that a collection with so many South Australian *Liparetri* as were in that which Germar described would not contain this common one. Germar does not mention the structure of the antennæ, which are eight-jointed, although Macleay's description particularly emphasises them as nine-jointed. The species in the Macleay Museum undoubtedly, however, has antennæ very easily seen to have only eight joints. Burmeister, I think, applied the name *nigrinus* to the same species, although there are difficulties in the way of that opinion. He gives the size as  $2\frac{3}{4}$ -3 l. (Germar says " $3\frac{1}{4}$  l.," Macleay  $3\frac{1}{2}$  l., the smallest specimen I have measured is, long. 4 l.), and says that the clypeus of the male is "obtuse tridentato." Macleay asserts that this (and Burmeister's assertion that the antennæ are eight-jointed) cannot be consistent with Burmeister's *nigrinus* being identical with his (Macleay's). In respect of the antennæ, it was Macleay's mistake, not Burmeister's, as already noted: in respect of the clypeus (the only remaining difficulty), there unquestionably is a slight tendency to bisinuation (scarcely sufficient to deserve mention, I admit, but to which Burmeister, no doubt, referred), in the front margin of the clypeus of the male of this species; indeed, I have a specimen in my own collection in which it is quite distinct, and it is just barely traceable in the specimens that are named *nigrinus* in the Macleay Museum. My conclusion, therefore, is that *nigrinus*, Germ., was correctly identified by both Burmeister and Macleay, the only doubt being connected with what neither of them mentions as a difficulty, viz., Germar's having called the front tibiæ bidentate. It should just be added that this difficulty cannot be got rid of by the supposition that Bur-

meister may not have counted the apical projection of the tibiæ as an external tooth, for in the case of other species he always does so count the apical projection.

*L. rugosus*, Macl. The presumable type of this species is in the Macleay Museum, pinned into the label "*rugosus*, S. Australia." It is a female of the species mentioned above as labelled in the same collection, "*nigrinus*, Germ." If it should prove eventually that there is another species (not known to me) which is the true *nigrinus*, the species I believe to be *nigrinus* would, of course, have to bear the name *rugosus*.

FIFTEENTH GROUP (AA, B, C, D, EE, OF TABULATION).

Although this group is distinguished from the preceding one by an apparently slight character (the elytra glabrous or nearly so), its species differ very much in facies from all of the fourteenth group, except *sylvicola*, Burm. (Fab. ?), to which latter they bear more resemblance of a general kind.

*L. ferrugineus*, Blanch. This is one of the most abundant and widely distributed *Liparetri*. It is remarkable for the pronotum of its male being entirely pilose, while that of the female has only an apical (and, of course, a lateral) fringe of hairs. Blanchard described a female; Macleay's redescription is a mixture of the two sexes. Both authors overlooked the fringe of hairs on the front of the clypeus in the female. I have examined the specimens in the Macleay Museum on which Macleay's redescription was doubtless founded.

*L. ubiquitousus*, Macl. It is strange that this common New South Wales *Liparetrus* should have remained undescribed until Macleay published his monograph. Nevertheless, it certainly seems to have been unknown to the earlier authors. Macleay is in error in attributing nine-jointed antennæ to it. It is rather near to *ferrugineus*, Blanch., but easily distinguished by the very different sculpture of the clypeus in the male, the much more pilose pronotum of the female, the different colouring, etc. I have examined the presumable type in the Macleay Museum.

*L. brunneipennis*, Blackb. This name is a synonym of *ubiquitousus*, Macl. At the time when I described the insect I accepted Macleay's statement that his species has nine-jointed antennæ.

*L. rubicundus*, Macl. Two (presumably including the type) are pinned into the label "*rubicundus*" in the Macleay Museum. Their antennæ have only eight joints, though Macleay calls them nine-jointed.

*L. propinquus*, Macl. Two specimens (including the presumable type) are pinned into the label "*propinquus*" in



the Macleay Museum. They have eight-jointed antennæ. This insect is, I have no doubt, the female of *rubicundus*, Macl.

SIXTEENTH GROUP (AA, B, C, DD, OF TABULATION).

This group includes the species having eight-jointed antennæ, front tibiæ tridentate externally, and pronotum without vestiture (unless along the lateral margins). The following notes are on species appertaining to it:—

*L. fallax*, Blackb. This species is well distinguished from *atriceps*, Macl., by the hind angles of its prothorax being distinctly defined. It also differs in colouring, its pronotum being uniformly testaceous brown, while that of *atriceps* presents the unusual character of being bicolorous (its front part black). Its pronotum, moreover, is notably less convex longitudinally, that of *atriceps* being exceptionally declivous immediately in front of the base. Also, the general dorsal sculpture of *fallax* is considerably finer and feebler than of *atriceps*. The sexual characters in both species seem to be slight, consisting in little more than an increased robustness of the front tarsi in the male.

*L. badius*, Macl., is referred by its author to a section of *Liparetrus*, to which he attributes nine-jointed antennæ; the antennæ nevertheless have only eight joints. I have examined the presumable type in the Macleay Museum. The clypeus of that specimen is distinctly bisinuate (or obsoletely tridentate) on its front margin, although that character is not mentioned in the description. I have examples before me of a *Liparetrus* from Beverley, W.A., which I hesitate to regard as specifically distinct from *badius*; nevertheless the front margin of its clypeus is more decidedly tridentate, its colour notably paler testaceous, and the puncturation of its elytra certainly finer and less close than in *badius*.

*L. monticola*, Macl. (? Fab.). In the Macleay Museum two very much broken specimens are pinned into the label bearing, "*monticola*, Fab." They are examples of two distinct species, one that which elsewhere in the same museum is labelled, "*atriceps*, Macl.," the other superficially resembling it, but different, *inter alia*, by the finer and sparser puncturation, and the well-defined hind angles of its pronotum. The latter is probably that on which Macleay's description is founded, as that description calls the pronotum "thinly punctate." I can give no opinion as to Macleay's reason for the identification with *monticola*—which seems to me doubtful in the extreme; out, as I am quite unable to identify *monticola* myself, I see no objection to allowing this species to stand as "*monticola*, Macl. (? Fab.)" provisionally.



*L. atriceps*, Macl. This is the species that I had formerly supposed to be *monticola*, Macl. (and have probably so named, for correspondents), on account of its having antennæ with only eight joints, whereas Macleay places *atricsps* in his section of the genus with nine-jointed antennæ. The presumable type is in the Macleay Museum bearing a label, "*atricsps*, Macl." I have mentioned others of its characters (above), under *L. fallax*, Blackb.

*L. micans*, Macl. Placed by Macleay in his monograph among the species with nine-jointed antennæ. I examined the presumable type, unique in the Macleay Museum, and made the following note on it:—"New to me. Antennæ eight-jointed. Near *fallax*, mihi, from which it differs, *inter alia*, by its quite different colouring, *i.e.*, dorsal and under surface entirely black except disc of elytra."

#### SEVENTEENTH GROUP (AA, B, CC, OF TABULATION).

This group contains only one known species—*L. criniger*, Macl.—easily recognised by its presenting the following characters in combination:—Antennæ eight-jointed, front tibiæ with three external teeth, basal joint of hind tarsi notably longer than second joint.

*L. perplexus*, Blackb. This name is a synonym of *L. criniger*, Macl., to which its author incorrectly attributes nine-jointed antennæ; and, owing to that error, I failed to discover the identity of the two until I recently found out that Macleay's characters are not reliable. I have examined the presumable type, in the Macleay Museum.

#### EIGHTEENTH GROUP (AA, BB, OF TABULATION).

A small aggregate of species presenting the unusual combination of eight-jointed antennæ, with front tibiæ having less than three external teeth.

*L. levatus*, Macl. Originally described by its author as *glaber* (*nom. præocc.*), and placed in Macleay's monograph among the species with nine-jointed antennæ. I have examined the presumable type, in the Australian Museum, and find that its antennæ have only eight joints.

*L. parvulus*, Macl. I have examined the presumable type, in the Australian Museum, and find (as Macleay says) that the difference is only in colour, which is, no doubt, either varietal or sexual. I unfortunately omitted to investigate the sex of the types. Both are from Gaydah.

#### NINETEENTH GROUP (AAA, OF TABULATION).

Easily distinguishable from all the other groups by the antennæ of its species having only seven joints.

*L. laevis*, Blanch. I have before me specimens from the Swan River (Blanchard's locality) of a species so satisfactorily agreeing with Blanchard's description of this species in every respect, except the number of joints in its antennæ, that I cannot escape the conclusion that that author was mistaken in regard to its antennæ, probably neglecting to examine the antennæ on account of the general resemblance of the insect to other *Liparetri*, which have nine-jointed antennæ. The same species stands in the Australian Museum as *L. laevis*, Blanch.

*L. agrestis*, Blackb. I regret to find that when I described this species I counted the joints in its antennæ incorrectly, and stated them as eight in number. There was no excuse for doing so (as the joints are evidently only seven). No *Liparetrus* had been previously described as having seven-jointed antennæ, although several species, really having such antennæ, had been described erroneously. I remember thinking that only seven joints was an impossible number, and persuading myself that I discerned a very minute additional joint. In a memoir which I published in the following year attention was first drawn to the existence of *Liparetri* having antennæ of only seven joints. Blanchard having attributed nine-jointed antennæ to his *L. laevis*, I did not take that species into account when I described *agrestis*, but I am now of opinion that the two names represent only one species.

*L. nigriceps*, Macl. I think there is little doubt of this being the female of *L. laevis*, Blanch. Macleay attributed nine-jointed antennæ to it. I have examined the presumable type, in the Australian Museum, and find it to be—though in very bad condition—certainly conspecific with specimens in my own collection, which I have long regarded as *nigriceps*, Macl., and as the female of *laevis*, Blanch.

*L. globulus*, Macl. The presumable type is in the Macleay Museum, and I have examined it there.

*L. tuberculatus*, Lea. This species is practically undescribed, the structure of the antennæ not being referred to except as involved in a reference to Macleay's grouping of the genus, in which (as mentioned above) the antennal structure is about as often wrong as right. There is no reference at all to the structure of the hind tarsi. As, however, there happens to be one marked character of the insect mentioned in the description, I have selected a *Liparetrus* presenting that character (which, however, is probably sexual), to be called "*tuberculatus*, Lea (?)," and have indicated its characters by its place in the foregoing tabulation.

*L. opacicollis*, Macl. The presumable type in the Macleay Museum has antennæ of only seven joints. It is near

*L. laevis*. Disregarding the difference in the vestiture of the pronotum, it is, *inter alia*, a considerably larger insect.

*L. squamiger*, Macl. I have examined the presumable type, which is in the Macleay Museum.

*L. necessarius*, sp. nov. Ovatus; minus nitidus; totus cinereo-pilosus, elytrorum pilis nigricantibus exceptis; niger, antennis (clava excepta) palpis et elytris (his ad basin anguste plus minusve nigricantibus) rufis, pedibus plus minusve piceis vel rufescentibus; antennis 9-articulatis; clypeo nitido fortiter minus crebre punctulato; fronte crebre nec subtiliter rugulosa; prothorace fortiter transverso, antice sat fortiter angustato, supra canaliculato, fere ut frons sed paullo minus crebre punctulato, lateribus sat arcuatis; elytris perspicue geminato-striatis, interspatiis sat fortiter vix crebre punctulatis; propygidio sparsius, pygidio magis crebre, rugulosis; tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divis); tarsorum posticorum articulo basali quam 2<sup>us</sup> sat breviori.

Maris clypeo antice sat profunde emarginato (fere ut *L. villosicollis*, Macl.), angulis sat acutis nec vel vix extrorsum directis; tarsis anticis sat incrassatis.

Feminæ clypeo truncato vix emarginato, angulis sat rotundatis. Long., 3-4 l.; lat.,  $1\frac{3}{5}$ - $2\frac{1}{5}$  l.

The characters indicated in the tabulation satisfactorily distinguish this species from its allies; it is well, however, to remark that it is apparently identical with all the specimens pinned into the label "*capillatus*, Macl.," in the Sydney Museums (so far as the bad condition of those specimens will allow comparison) except the one male in the Macleay Museum, which is the presumable type, and which agrees well with Macleay's description. From that male it differs considerably in vestiture, and also in the form of the clypeus, which, in the present species, is strongly emarginate, and notably less narrowed forward. It should be added that the emargination of the clypeus, though quite strong, is very different from the profound excision of the clypeus of *L. Kennedyi*, Macl. The notably darker colour of the pilosity of the elytra in comparison with that of the pronotum is an unusual character.

Western Australia (Perth, Mr. Lea).

*L. distans*, sp. nov. Ovalis; sat nitidus; supra sat glaber (lateribus piloso-fimbriatis); subtus cinereo-pilosus; ferrugineus, antennis pallidioribus (his 9-articulatis); clypeo leviter sat grosse subsquamoso-punctulato, antice 3-vel 4-dentato; fronte sat æquali, subtiliter cre-

berrime punctulata: prothorace valde transverso, supra vix manifeste canaliculato antice sat angustato, minus crebre minus subtiliter punctulato, lateribus leviter arcuatis: elytris sat fortiter geminato-striatis, interstitiis subfortiter minus crebre punctulatis; propygidio pygidioque coriaceis, illo vix perspicue punctulato, hoc puncturis sparsis sat magnis minus fortiter impresso et apicem versus plus nonnullis vestito: tibiis anticis extus 3-dentatis (dentibus intervallis subæqualibus divis); tarsorum posticorum articulo basali quam 2<sup>us</sup> perspicue (nec valde) breviori.

Maris abdomine toto longitudinaliter sulcato.

Fem. latet. Long.,  $5-5\frac{1}{2}$  l.; lat.,  $2\frac{1}{2}-2\frac{4}{5}$  l.

One of the largest species in the genus, and with no nearly among the previously described *Liparetri*. I have three specimens before me (two of them belonging to Mr. Griffith), which appear to be of one sex, and the peculiar concavity running down the whole length of the ventral segments is certainly indicative of their being males. In one example the median projection of the clypeus is bifid, making the front of the clypeus 4-dentate.

N.W. Australia.

*L. lividipennis*, sp. nov. Ovatus: sat nitidus: supra sat glaber (fronte pilis erectis vestita, lateribus piloso-fimbriatis, propygidio pygidioque setis crassis brevibus subsquamiformibus vestitis); subtus cinereo-pilosus: niger, elytris lividis margine obscuro anguste cinctis; antennis 9-articulatis: clypeo antice truncato (angulis subrectis), grosse squamoso-punctulato: fronte sat æquali, crebre subtiliter punctulata: prothorace fortiter transverso, vix perspicue canaliculato, supra ut frons punctulato, antice sat angustato, lateribus leviter arcuatis, pilis lateralibus albidis; elytris vix fortiter geminato-striatis, interspatiis sat fortiter minus crebre punctulatis; propygidio crebre subtiliter, pygidio minus crebre minus subtiliter, punctulatis: tibiis anticis extus leviter 3-dentatis (dentibus intervallis subæqualibus divis, dente summo subobsoleto); tarsorum posticorum articulo basali quam 2<sup>us</sup> multo breviori.

Maris quam feminae antennarum flabello longiori, tarsis anticis robustioribus. Long.,  $3-3\frac{1}{2}$  l.; lat.,  $2-2\frac{1}{2}$  l.

The uppermost tooth of the front tibiæ is very feeble, and seems to indicate this as a transition form leading on to the *Liparetri* having less than three external teeth. I have two specimens before me, which I believe to be male and female, as the antennal flabellum is distinctly



longer and the front tarsi more robust in one than in the other. There is no marked difference between them in respect of the clypeus.

South Australia.

*L. incertus*, sp. nov. Ovatus: sat nitidus: nonnihil iridescent; supra sat glaber (lateribus piloso-fimbriatis, propygidio pygidioque setis brevibus albidis adpressis vestitis), subtus cinereo pilosus: niger, nonnullorum exemplorum elytris plus minusve piceis vel rufis, antennis (clava excepta), palpisque rufis, pedibus plus minusve rufescentibus; antennis 9-articulatis; clypeo modice reflexo, nitido, sat grosse leviter squamoso-punctulato; fronte antice impressa, crebre punctulata; prothorace fortiter transverso, supra fortius sat crebre punctulato, sat late leviter (basin versus sat fortiter) canaliculato, antice fortiter angustato, lateribus arcuatis (ante basin sat fortiter rotundato-dilatatis); elytris sat elongatis, sat fortiter geminato-striatis, interspatiis sat fortiter sat crebre punctulatis; propygidio subtilius, pygidio magis fortiter, punctulatis, ambobus plus minusve perspicue carinatis; tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divisus); tarsorum posticorum articulo basali quam 2<sup>us</sup> sat (nec valde) breviori.

Maris quam feminae antennarum flabello sat longiori, tarsis anticis multo robustioribus, clypeo antice magis truncato et obsoletissime tridentato. Long.,  $3\frac{1}{2}$ - $3\frac{3}{5}$  l; lat.,  $2-2\frac{1}{5}$  l.

This species bears much resemblance to *L. picipennis*, Germ., from which, however, it may be at once separated by, *inter alia*, the absence of any erect hairs on the front margin of the pronotum, and the evident (though slight) tendency to tridentation of the front margin of the clypeus in the male. It seems to be a fairly common species in Victoria and New South Wales (southern parts), so that it is difficult to believe Sir W. Macleay had not seen it, but I conjecture that he had not noticed its distinctions from *picipennis*. The colour of the elytra is very variable, but whatever the colour a slight iridescence seems to be constant.

Victoria and New South Wales.

*L. vicarius*, Blackb. Ovatus: minus nitidus: niger, antennis palpis pedibus elytris (et non-nullorum exemplorum abdomine prothoraceque) rufescentibus; supra glaber: subtus pilosus; antennis 9-articulatis; clypeo minus crebre punctulato, antice late rotundato (vix subtruncato); fronte crebre punctulata; prothorace fortiter transverso, antice sat fortiter angustato, supra minus crebre subtilius punctulato, haud canaliculato, lateribus



sat arcuatis; elytris geminato-striatis, inter-spatiis subfortiter sat crebre punctulatis; propygidio pygidioque crebre sat fortiter punctulatis; tarsorum posteriorum articulo basali quam 2<sup>us</sup> sat breviori; tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divisus). Long., 3-3½ l.; lat., 1½-2 l.

I think, from slight differences in the form of the abdomen, that I have both sexes of this species before me, but I do not find any sexual characters in the clypeus or tarsi. This insect is near *incertus*, Blackb., from which it differs, *inter alia*, by the considerably less coarse puncturation of its elytra, its non-canaliculate pronotum, and its front tarsi much shorter than those of either sex of *incertus*.

North Queensland.

*L. amabilis*, sp. nov. Ovatus; parum nitidus; capite prothorace sternisque nigris, elytris abdomine propygidio pygidioque læte rufis, antennis palpis pedibusque ferrugineis vel picescentibus; antennis 9-articulatis, stipite brevissimo; clypeo squamoso-punctulato, antice late subtruncato, cum fronte et pronoto (hoc basin versus glabro) pilis erectis obscure brunneis (certo ad aspectum nigricantibus) vestito: fronte sat æquali, cum prothorace crebre subrugulose punctulata: hoc fortiter transverso, vix perspicue canaliculato, antice fortiter angustato, lateribus postice ampliato-rotundatis antice sinuatis; elytris minus fortiter geminato-striatis, interspatiis leviter minus subtiliter punctulatis, glabris; propygidio pygidioque pilis brevibus erectis albidis vestitis, hoc grosse (illo sat fortiter) minus crebre punctulatis; corpore subtus albido-piloso: tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divisus); tarsorum posteriorum articulis basalibus 2 inter se sat æqualibus. Long., 2½ l.; lat., 1⅔ l.

A very distinct species by the structural characters indicated in the tabulation: also by its colouring, which is a uniform bright red, except the black of the head, prothorax, and sterna. It is one of the prettiest of the *Liparetri*. I think the unique type to be a female.

New South Wales (Mulwala): sent by Mr. Sloane.

*L. analis*, Blackb.? (Mas.). Ovatus: sat nitidus: niger elytris tarsisque obscure rufis, antennis (clava picea excepta) palpisque testaceis, pedibus plus minusve picescentibus: supra glaber (pronoto antice et ad latera pilis fulvis elongatis fimbriato excepto): subtus pilosus; antennis 9-articulatis, stipite perbrevis: clypeo antice

leviter emarginato sat fortiter reflexo; fronte crebre subtilius rugatim punctulata, antice impressa, postice longitudinaliter nonnihil subcarinata: prothorace valde transverso, supra sparsius sat fortiter punctulato, subiridescenti, leviter canaliculato, antice sat angustato, lateribus sat arcuatis; elytris minus perspicue geminato-striatis, interspatius fortiter sat crebre punctulatis; propygidio subtiliter minus crebre (prope apicem magis fortiter) punctulato, longitudinaliter subcarinato: pygidio fortiter sat crebre punctulato, antice longitudinaliter fortiter carinato; tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divisus): tarsorum posticorum articulo basali quam 2<sup>us</sup> parum breviori. Long., 3 l.: lat., 1 $\frac{3}{5}$  l.

I have abstained from giving a separate name to this insect, because, in view of the great sexual differences of some *Liparetri*, and of the fact that the unique example described above is a male, while the unique type of *analís* is a female, I see nothing conclusive against their specific identity. The two specimens differ greatly in colouring, and the pygidium of *analís* is non-carinate. The hind tarsi of *analís* (type) have only the basal joint, but it is quite like the basal joint of the hind tarsi of the specimen described above. If further investigation should prove that the male described above is distinct from *analís*, it will be time then to give it a separate name. The *habitat* of the type of *analís* is uncertain. The fact that the basal joint of the hind tarsi is a trifle shorter than the second joint renders it desirable to compare it with the species of the third group, from all of which its nitid pronotum bearing strong, decidedly sparse puncturation, in combination with its colouring and smaller size, readily distinguishes it.

South Australia (Kangaroo Island). In S.A. Museum.

*L. consanguineus*, sp. nov. Ovatus: sat nitidus: niger, supra nonnihil cœruleo-iridescens, antennis (clava picea excepta) palpisque rufis, pedibus plus minusve picescentibus: supra sat glaber: pronoti marginibus omnibus pilis brunneis elongatis fimbriatis, propygidio pygidioque sparsim pilosis: subtus pilosus: antennis 9-articulatis: clypeo antice late rotundato vix subtruncato, leviter reflexo, crebre subtilius sat profunde (nec squamose) punctulato: fronte sat æquali, fere ut clypeus (sed antice magis subtiliter) punctulata: prothorace valde transverso, supra (basin versus) vix perspicue canaliculato, antice minus angustato, leviter subtilius (in disco sparsim latera versus magis crebre) punctulato, lateribus sat arcuatis: elytris

manifeste geminato-striatis, interspatiis fortius sat crebre punctulatis; propygidio pygidioque subopacis, illo leviter sparsius, hoc magis crebre magis fortiter, punctulato; tibiis anticis extus tridentatis (dentibus intervallis subæqualibus divisus); tarsorum posticorum articulis basalibus 2 sat æqualibus. Long.,  $3\frac{3}{4}$  l.: lat.,  $2\frac{1}{5}$  l.

A very broad species, bearing much superficial resemblance to several other species, from most of which it is distinguished by the vestiture of its pronotum, that segment being glabrous except on the margins, which are fringed by long, erect pilosity. As the basal joint of its hind tarsi is possibly a trifle shorter than the second joint it seems desirable to indicate the characters that (apart from the hind tarsi) distinguish it from those species of the third group which are not very differently coloured. From all of them known to me it differs, *inter alia*, by the form of its clypeus and the very much feebler and sparser puncturation of its pronotum. The unique type is a male.

South Australia (Tintinnarra): in S.A. Museum.

*L. puer*, sp. nov. Ovatus: sat opacus: niger, elytris (his nonnihil iridescentibus) cum propygidio pygidioque piceis vel rufescentibus, antennis (clava picea excepta) palpis pedibusque rufis, elytris basin versus obscure nigricantibus: supra sat glaber, sed capite piloso pronoti marginibus omnibus pilis erectis perlongis fimbriatis propygidio pygidioque sparsim pilosis: subtus pilosus: antennis 9-articulatis (stipite perbrevis): clypeo antice late rotundato (fere subtruncato), sat fortiter reflexo, crebre subtiliter fere ut frons (hoc sat æquali) punctulato: prothorace fortiter transverso, æquali, subtilius subobsolete punctulato, inter puncturas nonnihil ruguloso vel subgranuloso, antice minus angustato, lateribus sat arcuatis: elytris manifeste geminato-striatis, interspatiis fortiter (fere subgrosse) vix crebre punctulatis: propygidio sat fortiter minus crebre punctulato, sat nitido: pygidio sparsius sat grosse punctulato, nitido: tibiis anticis tridentatis (dentibus intervallis subæqualibus divisus): tarsorum posticorum articulo basali quam 2<sup>us</sup> vix breviori.

Maris quam feminae antennarum flabello paullo longiori, tarsis anticis longioribus et robustioribus: maris pygidio longitudinaliter leviter (feminae nullo modo) carinata. Long.,  $2\frac{1}{5}$  l.: lat.  $1\frac{1}{5}$  l.

This very small *Liparetrus* seems not very close to any other species known to me, and clearly distinct from all those described by Macleay. I suspect that Macleay would

have placed it in the *discipennis* group near *holosericeus*, MacL., which, however, he places in that group only with doubt. *Holosericeus* is a larger insect, differently coloured, and is glabrous above. It is, moreover, from a widely distant locality. It may be noted that there are a few hairs on the disc of the pronotum of *puer*, but they are quite inconspicuous compared with the strong frill of long pilosity across the front margin.

South Australia (Eucla district).

*L. Perkinsi*, sp. nov. Ovatus; minus nitidus; niger, sat iridescent; elytris antennis palpisque rufo-testaceis, pedibus plus minusve rufescentibus; supra sat glaber, subtus pilosus; antennis 9-articulatis; clypeo antice dentibus 3 fortibus acutis recurvis armato, nitido, subsquamose vix crebre punctulato, fronte coriacea crebre subtiliter punctulata; prothorace fortiter transverso, vix perspicue canaliculato, supra fere ut frons sed minus crebre punctulato, antice fortiter angustato, lateribus fortiter rotundatis; elytris subfortiter geminato-striatis, interspatiis subfortiter vix crebre punctulatis; propygidio pygidioque æqualibus, æqualiter ut frons sculpturatis; tibiis anticis extus fortiter tridentatis (dentibus intervallis subæqualibus—sed superioribus 2 nonnihil approximatis—divisis); tarsorum posticorum articulo basali quam 2<sup>us</sup> manifeste (vix multo) longiori. Long.,  $2\frac{3}{4}$ -3  $\frac{1}{2}$  l.; lat.,  $1\frac{3}{5}$ -1  $\frac{7}{10}$  l.

The unusual character of three sharp recurved teeth projecting from the front of the clypeus distinguishes this species from nearly all its congeners. The two species to which Macleay attributes that character have their head and pronotum villose. I do not find any marked sexual characters in any of the eight specimens that I have seen of this insect, though I think (from slight abdominal differences) that both sexes are present.

North Queensland. (Sent by Mr. R. C. L. Perkins.)

*L. alienus*, sp. nov. Elongato-ovatus; minus nitidus; niger, antennis (clava picea excepta) palpis elytris pedibus feminaeque abdomine rufis; supra totus (propygidio pygidioque albido-pilosus exceptis) pilis sat elongatis nigris erectis minus dense vestitus; subtus cinereo-pilosus; antennis 9-articulatis; clypeo subnitido, squamose punctulato, antice truncato (angulis obtusis); fronte æquali, ut pronotum coriacea sparsim sat grosse punctulata; prothorace fortiter transverso, æquali, antice sat angustato, lateribus arcuatis; elytris sat elongatis, sparsim subseriatim subgrosse nec profunde punctulatis,



haud striatis; propygidio pygidioque subnitidis, coriaceis, sparsius leviter subgrosse punctulatis; tibiis anticis extus bidentatis; tarsorum posticorum articulo basali quam 2<sup>us</sup> vix breviori.

Maris antennarum clava quam feminae manifeste longiori, tarsis anticis paullo longioribus pygidio subtus producto sic ut segmenta ventralia brevissima sunt in medio. Long.,  $1\frac{3}{4}$ - $2\frac{1}{2}$  l.; lat.,  $1$ - $1\frac{1}{5}$  l.

I am not sure that this species might not properly be regarded as the type of a new genus allied to *Liparetrus*. Its long elytra almost covering the propygidium in both sexes and its depressed elongate appearance, together with its peculiar sculpture and vestiture, render it very isolated in this genus. I cannot, however, discover any definite structural character that is not paralleled in some unquestionable *Liparetrus*, unless it be the abdominal character of the male (*i.e.*, the pygidium folded under so as to narrow, as if crowded together, the ventral segments on the middle line). This, however, does not seem sufficient to justify the creation of a new genus. It should be noted that in both sexes the front tarsi are remarkably short, being (even in the male) less than half as long as the hind tarsi: and that the erect hairs on the elytra are disposed in longitudinal rows.

Western Australia. (Beverley: Mr Lea.)

*L. rotundicollis*, sp. nov. Sat breviter ovatus; minus nitidus; niger vel piceo-niger, iridescens, antennis palpisque rufis, pedibus (et nonnullorum exemplorum pygidio) plus minusve rufescentibus: totus cinereo-pilosus (capite pronotoque fulvo-pilosis exceptis): antennis 9-articulatis; clypeo nitido, crebre subgranulatum punctulato, antice truncato; fronte sat æquali fere ut clypeus punctulata; prothorace fortiter transverso, antice sat angustato, æquali, supra confertim subtiliter ruguloso, lateribus fortiter rotundatis: elytris obsolete geminato-striatis, interspatiis crebre fortius punctulatis: propygidio pygidioque fortiter crebrius punctulatis: tibiis anticis extus bidentatis (dente superiori subobsoleto): tarsorum posticorum articulis basalibus 2 sat æqualibus inter se. Long.,  $2\frac{4}{5}$ - $3\frac{1}{2}$  l.; lat.,  $1\frac{3}{5}$ - $1\frac{4}{5}$  l.

I have seen two specimens of this insect, and do not find any defined sexual characters among them. They are probably females, and it is not unlikely that the male has some distinctive character in the ventral segments and clypeus. The species described above is very different from all its allies (*inter alia*, by the very close, strong, subrugulose puncturation of its elytra, and its colouring), and may safely be

described without the knowledge of both sexes. It is not unlike *L. nudipennis*, Germ., superficially, but is very distinct from that species by, *inter alia*, the pilosity of its elytra.

South Australia.

*L. ventralis*, sp. nov. (Mas.). Breviter ovatus; sat opacus; niger, antennis palpis elytris (his anguste nigrocinctis) tibiis anticis tarsisque omnibus brunneo-testaceis: totus albido-pilosus; antennis 9-articulatis: clypeo nitido minus crebre, fronte sat crebre, rugulosis: prothorace fortiter transverso, antice sat angustato, supra minus crebre punctulato, vix ruguloso, haud canaliculato, lateribus sat rotundatis: elytris vix perspicue geminato-striatis, interspatiis leviter minus subtiliter punctulatis: propygidio leviter sat crebre, pygidio sat profunde minus crebre, punctulatis; tarsorum posticorum articulo basali quam 2<sup>us</sup> dimidia parte longiori; tibiis anticis unidentatis: segmento ventrali apicali antice longitudinaliter obtuse bicarinato, ad apicem deorsum acute bispinoso. Long.,  $2\frac{1}{5}$  l.: lat.,  $1\frac{3}{5}$  l.

This species differs from all the others described, of the same group, by its combination of bicolorous elytra, front tibiæ without any trace of an external tooth above the apical projection, and hind tarsi with basal joint much longer than the second joint. It is rather close to *L. assimilis*, MacL., from which (I have examined the presumable type, unique, in the Macleay Museum) it differs by the uniform whitish colour of its vestiture, *assimilis* having much very dark brown pilosity, as well as by the much longer basal joint of its hind tarsi.

North Queensland.

*L. gravidus*, sp. nov. Sat late ovatus: minus nitidus: niger, antennis palpis, elytris (his obscuro-cinctis) et (pilus minusve) pedibus testaceis vel ferrugineis: capite, pronoto elytris (basin versus), propygidio pygidioque (hoc cum propygidio etiam setis adpressis albidis vestito) pilis brunneis vestitis: corpore subtus cinereo-piloso: antennis 9-articulatis: clypeo antice truncato, cum fronte (hac sat æquali) pronotoque crebre ruguloso: prothorace fortiter transverso, supra obsolete canaliculato, antice fortiter angustato, lateribus arcuatis: elytris obsolete geminato-striatis, interspatiis leviter nec crebre punctulatis; propygidio pygidioque confertim subtiliter rugulosis; tibiis anticis extus bidentatis: tarsorum posticorum articulis basalibus 2 inter se sat æqualibus.

Maris clypeo quam feminae magis elongato magis abrupte truncato, antennarum flabello paullo longiori, tarsis anticis multo longioribus. Long.,  $4-4\frac{1}{2}$  l.: lat.,  $2\frac{1}{5}-2\frac{1}{2}$  l.

Rather closely allied to *L. luridipennis*, Mael., but larger and differently coloured (the elytra more ferruginous, and with a better defined, dark bordering), the upper tooth of the front tibiæ much stronger, and (especially) the basal region of the elytra pilose.

Western Australia (Swan River): Mr Lea.

*L. cinctipennis*, sp. nov. Breviter ovatus; minus nitidus; niger, antennis (clava picea excepta) palpis et elytris (marginibus late nigris exceptis) ferrugineis, pedibus plus minusve picescentibus: supra sat glaber, pronoto antice et ad latera piloso-fimbriato, propygidio pygidioque setis adpressis albidis vestitis; subtus cinereo-pilosus; antennis 9-articulatis; clypeo antice truncato, cum fronte (hac sat æquali) pronotoque confertim subtiliter ruguloso; prothorace fortiter transverso, æquali, antice sat fortiter angustato, lateribus arcuatis: elytris obsolete geminato-striatis, interspatiis leviter nec crebre punctulatis; propygidio pygidioque crebre sat subtiliter rugulosis; tibiis anticis extus bidentatis (dente superiori minuto vel sub-obsoleto): tarsorum posticorum articulo basali quam 2<sup>us</sup> vix longiori.

Maris quam feminae clypeo magis abrupte truncato, antennarum flabello parum longiori, tarsis anticis paullo robustioribus. Long., 3 l.: lat., 2 l.

Easily distinguishable from *L. luridipennis*, Mael., and *gravidus*, Blackb., by, *inter alia*, the non-pilose disc of its pronotum and the deep black, much wider, and more sharply defined bordering of its elytra.

Western Australia (Perth).

*L. minor*, sp. nov. (Mas.)—Ovatus: minus nitidus: piceus, vix rufescens, clypeo antennis (clava picea excepta) palpis pedibus elytrisque testaceo-brunneis: supra glaber: subtus sparsim pilosus: antennis 9-articulatis: clypeo nitido sparsim punctulato, antice tridentato (dente mediano sat acuto): fronte crebre subtiliter subaspere punctulata, sat æquali: prothorace sat fortiter transverso, antice fortiter angustato, supra subtilius sparsim leviter punctulato, postice obsolete impresso, lateribus sat fortiter rotundatis: elytris obsolete geminato-striatis interspatiis sparsius sat fortiter punctulatis: propygidio pygidioque crebre punctulatis: tibiis anticis extus, 1-dentatis: tarsorum posticorum articulo basali quam 2<sup>us</sup> manifeste breviori. Long., 2 l.; lat, 1½ l.

The clypeus of the female is probably less strongly tridentate than that of the male, but in the male the median tooth is so well defined that it is not likely to be unrepres-

sented in the female. The front tibiæ have no distinct tooth (scarcely even an inequality) above the apical projection. All the species placed by Macleay among those having the clypeus tridentate in the male and which bear any superficial resemblance to this insect, have the basal joint of their hind tarsi longer than the second joint. It should be noted that although in my unique example of this insect the propygidium and pygidium are glabrous, I judge from the nature of the sculpture and the analogy of allied species that those parts are probably abraded, and that in a fresh specimen they might bear some sparse vestiture.

Queensland: Port Mackay (Mr. Lower).

*L. brevipes*, sp. nov., fem. Breviter ovatus; subnitidus; brunneo-testaceus, antennarum clava capiteque piceo-nigris, prothorace testaceo-rufo: supra glaber; subtus cinereo-pilosus: antennis 9-articulatis; clypeo antice rotundato, ut frons (nac sat æquali) transversim crebre ruguloso; prothorace fortiter transverso, antice sat angustato, supra obsolete canaliculato, subtilius sat crebre punctulato, lateribus arcuatis: clytris sat fortiter geminato-striatis, interspatiis sat fortiter vix crebre punctulatis: propygidio pygidioque fortiter sat crebre punctulatis: tibiis anticis extus 1-dentatis: tarsis brevibus, posticorum articulo basali quam 2<sup>us</sup> parum breviori. Long.,  $2\frac{4}{5}$ : lat.,  $1\frac{1}{5}$  l.

An exceptionally wide species, and with unusually short tarsi. It is not very close to any other species known to me except the next species to be described (*L. Blanchardi*, sp. n.), but bears considerable superficial resemblance to *L. latus*, Blackb., which, however, *inter alia*, has antennæ consisting of only eight joints, and front tibiæ conspicuously bidentate externally.

Western Australia (Perth).

*L. Blanchardi*, sp. nov., fem. Sat breviter ovatus: minus nitidus: brunneo-testaceus, fronte et (angustissime) elytrorum basi nigris, sterno paullo infuscato: supra fere glaber (pygidio sparsius brevissime villosus): subtus cinereo-pilosus: antennis 9-articulatis; clypeo nitido leviter squamose punctulato, antice subtruncato (latissime rotundato): fronte sat æquali, subtilius minus crebre punctulata: prothorace fortiter transverso, antice fortiter angustato, supra postice vix manifeste canaliculato, sat crebre minus subtiliter punctulato, lateribus fortiter rotundatis: elytris leviter geminato-striatis, interspatiis sat fortiter sat crebre punctulatis: propygidio pygidioque crebre minus fortiter punctulatis: tibiis anticis extus



1-dentatis; tarsis modice elongatis, posticorum articulis basalibus inter se sat æqualibus. Long., 2 l.; lat.,  $1\frac{1}{5}$  l.

Somewhat closely allied to the preceding. Disregarding the somewhat considerable differences in colouring, it differs, *inter alia*, by the sculpture of its head, the much more strongly rounded sides of its pronotum, and its considerably longer tarsi.

Queensland (Port Mackay).

*L. Leai*, sp. nov. Ovatus; minus nitidus: niger, antennis (clava excepta) palpis et elytris (his anguste piceo-cinctis) brunneo-testaceis, pedibus picescentibus; supra fere glaber, propygidio pygidioque setis adpressis albidis vestitis; subtus cinereo-pilosus: antennis 9-articulatis; clypeo (ut frons, hac sat æquali) transversim ruguloso, antice subtruncato; prothorace fortiter transverso, antice angustato, supra postice vix canaliculato, leviter sat crebre vix subtiliter punctulato, lateribus arcuatis; elytris leviter geminato-striatis, interspatiis sat fortiter vix crebre punctulatis; propygidio pygidioque sat crebre sat fortiter (hoc quam ille magis fortiter) punctulatis; tibiis anticis extus 1-dentatis: tarsorum posticorum articulis basalibus 2 inter se sat æqualibus. Long., 3 l.; lat.,  $1\frac{3}{5}$  l.

I believe that both sexes of this species are before me; if so the sexual characters are slight, consisting in a slight additional robustness in the front tarsi (and especially the front claws) of the male. It is possible, however that the specimen I regard as the female may be a somewhat feebly developed male. This species bears much superficial resemblance to *L. ovatus*, Macl., but differs, *inter alia*, by its front tibiæ having no external tooth above the apical projection and its pronotum having no dorsal channel except a faint impression close to the base (which is entirely wanting in very few *Liparetri*).

Western Australia: Perth (from Mr. Lea).

*L. rugatus*, sp. nov., fem. Late ovatus: minus nitidus; niger, antennis (clava obscura excepta) palpis elytris (his basin versus nigricantibus) abdomineque obscure rufis, pedibus picescentibus: supra in pronoto propygidio pygidioque pilis erectis vestitus: subtus cinereo-pilosus; antennis 8-articulatis: clypeo crebre sat fortiter punctulato, antice truncato, fronte sat æquali, fere ut clypeus punctulata: prothorace fortiter transverso, antice sat angustato, supra æquali, inæqualiter (prope apicem et basin fere ut frons, in disco magis grosse minus crebre)

punctulato, lateribus arcuatis; elytris vix manifeste geminato-striatis, interspatiis fortiter crebre subrugulose punctulatis transversim rugatis; tibiis anticis extus 3-dentatis (dentibus intervallis subæqualibus divisus); tarsorum posticorum articulis basalibus 2 inter se sat æqualibus. Long.,  $3\frac{1}{2}$  l.; lat.,  $2\frac{1}{5}$  l.

This species is evidently allied to *L. ferrugineus*, Blanch., from which it is easily distinguishable by, *inter alia*, the much closer and stronger puncturation of its elytra, and the very evidently greater length of the basal joint of its hind tarsi.

North Queensland.

*L. insolitus*, sp. nov. Ovatus; vix nitidus; niger, antennis (clava excepta) palpis, elytris (his ad basin anguste nigricantibus) ferrugineis, pedibus et nonnullorum exemplorum pygidio picescentibus; supra (elytris—nisi ad basin summam—capiteque exceptis) pilis erectis fulvis vestitus; subtus cinereo-pilosus; antennis 7-articulatis; clypeo sat subtiliter subsquamose punctulato; fronte leviter inæquali, quam clypeus magis subtiliter magis crebre vix squamose punctulata: prothorace fortiter transverso, antice fortiter angustato, supra minus perspicue canaliculato, subgrosse nec profunde vix crebre punctulato, lateribus modice arcuatis; elytris sat fortiter geminato-striatis, interspatius sat fortiter sat crebre punctulatis; tarsorum posticorum articulo basali quam 2<sup>us</sup> parum breviori: tibiis anticis extus tridentatis.

Maris clypeo antice abrupte truncato (fere subemarginato); tarsis anticis sat elongatis: propygidio sparsim dupliciter (subtiliter et subfortiter), pygidio magis fortiter magis crebre, punctulatis.

Feminae clypeo antice minus abrupte truncato, tarsis anticis brevioribus, propygidio pygidioque confertim rugulosis. Long.,  $3\frac{1}{2}$ -4 l.; lat., 2-2 $\frac{1}{4}$  l.

This species may be described as superficially a close ally of *L. phœnicopterus*, Germ., having antennæ consisting of only seven joints. No other known to me of the species with similar antennæ (seven-jointed) bears the least resemblance to it.

Western Australia: Swan River (Mr. Lea).

#### MICROTHOPUS.

I diagnosed the genus *Macleayia* in Tr.R.S.S.A., 1887, and in the same volume added a note as to the possibility of its identity with Burmeister's genus *Microthopus*. Since that time I have had the opportunity of examining large numbers of *Liparetroid* Coleoptera, from Western Australia, and as I

have not met with any insect more likely to be *Microthopus*, I have recently reconsidered the question of the identity with it of *Macleayia*, and am now of opinion that the two genera cannot be separated. The discrepancy between *Macleayia* and the diagnosis of *Microthopus* consists in the flabellum of the antennæ of the male of *Macleayia* being five-jointed, while it is said to be three-jointed in *Microthopus*. The extreme variability of the antennal structure, however, among many Australian *Melolonthides* that seem to present no other difference likely to be generic, seems to forbid the acceptance of that as a valid generic character. Indeed, having now seen what I believe to be the male of my *M. hybrida* (the second species that I attributed to *Macleayia*), I am fairly confident that in that insect the flabellum of both sexes is three-jointed. Therefore, I do not regard *Macleayia* as more than a subgenus of *Microthopus*, containing only one described species (*singularis*, Blackb.), while two described species (*hybrida*, Blackb., and *castanopterus*, Burm.), are of *Microthopus* in the strict sense. It is even possible that *hybrida* is a variety of *castanopterus*, as there does not seem to be any good character to separate them, apart from colour: but it would not be safe to pronounce them specifically identical without examining a specimen agreeing in all respects with Burmeister's description.

Burmeister distinguishes *Microthopus* from *Liparetrus* by characters that are quite insufficient now that the species of the latter genus have been found to be so numerous and varied in structure, viz., its more elongate elytra and less convex pygidium. It is well differentiated, however, by a character that I have already referred to (Tr.R.S.S.A., 1898, p. 31), as of great value for the generic distribution of the Australian *Melolonthides*, viz., the sculpture of the elytra, which in *Microthopus* (but in no *Liparetrus* known to me), consists of well-defined, uniform striation.

#### AUTOMOLUS.

In Tr.R.S.S.A., 1898, p. 31, I suggested the possibility of the species on which this Tasmanian genus was founded being congeneric with some of those of which Macleay formed his second section of *Liparetrus*. I am now, after a much more extensive study of *Liparetroid Lamellicornes*, very confident that my conjecture was correct. As is so frequently the case in respect of the *Melolonthides* of Australia, the genera involved in this discussion have been rendered more difficult to identify by the absence of knowledge, on the part of their founders, of the extreme variability of the antennæ of the insects in question. Burmeister gives "nine-jointed

antennæ" as a generic character of *Automolus*, and Macleay makes "antennæ eight-jointed" the essential character of his second section of *Liparetrus*. As I have already remarked, authors have so obviously been in the habit of assuming it unnecessary to count the joints carefully in more than one of an aggregate (of Australian *Melolonthides*) of evidently closely allied species, that there is no reason whatever for deciding against the identity of two generic names merely because the insects they are applied to have antennæ differing in the number of joints. And, in the case of the species under discussion, the further consideration must not be overlooked that they have antennæ of which the stipes is extremely short and difficult to examine. In the present case the really reliable distinction of most of the species included by Macleay in his second section of *Liparetrus* from all of those which he places in the first section is to be found in the structure of the front tibiæ—which have two adjacent external teeth close to the apex, and one (a very small one) close to the base (the margin of the tibiæ between them being straight or all but straight)—a structure which I have seen in no *Liparetroid* species that is not obviously a close ally of these insects (e.g., *Automolus* (*Liparetrus*) *poverus*, Blanch.). That structure is assigned by Burmeister to the front tibiæ of *Automolus*: and the assignment to it of nine-jointed antennæ need occasion no difficulty in associating it with species having similar tibial structure and eight-jointed antennæ, because on the one hand Burmeister might be almost excusable if he miscounted the joints of such obscure antennæ, and, on the other hand, at least one of the species before me with the tibial structure indicated above, has nine-jointed antennæ.

As regards Burmeister's species (*A. angustulus*), the description is in general certainly suggestive of my *Automolus* (*Liparetrus*) *alpicola*. I am, however, confident in saying that the antennæ of the latter have only eight joints, and I have not met with it, nor seen it, from Tasmania. These considerations combined lead me to the opinion that *A. angustulus*, Burm., is a species that I have not seen, and which has not been redescribed by any author. I regard *Automolus* as a valid genus.

---